



Software Development Life Cycle



Objectives

At the end of this lesson, learners will be able to:

- Define the Software Development Cycle (SDLC).
- Describe the steps contained in the Software Development Cycle (SDLC):
 - Requirement Analysis.
 - Design.
 - Development/Coding.
 - Testing
 - Deployment
 - Maintenance



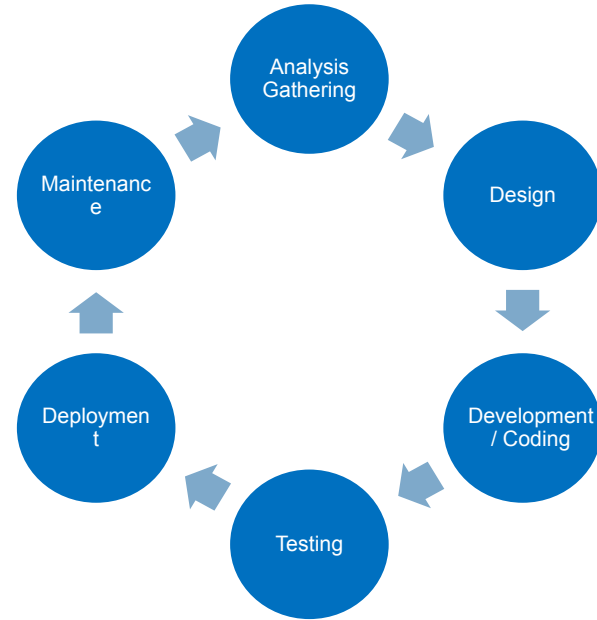
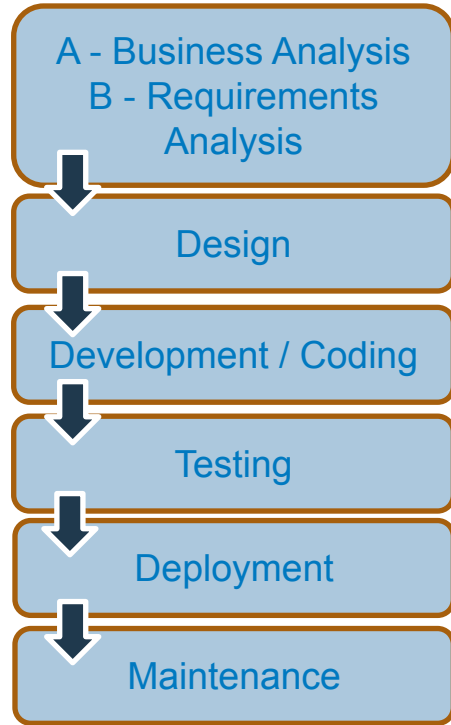
Software Development Life Cycle

The Software Development Life Cycle (SDLC) is a process used by the software industry to produce high-quality systems that meet or exceed the customer's expectations. The SDLC:

- Works effectively (performs its task well).
- Works efficiently (does not cost too much to operate).
- Is inexpensive to maintain.
- Is cost-effective to enhance.
- Must be produced within time and cost estimates.



Software Development Life Cycle - Phases



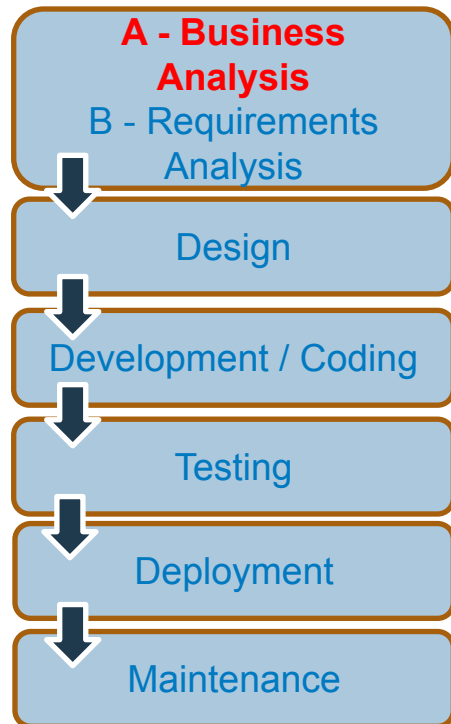
First Family Home

In order to get a clearer understanding of the SDLC, we will look at what it takes to build a family home.

There is a great deal of planning involved in building a home.



1A - Business Analysis



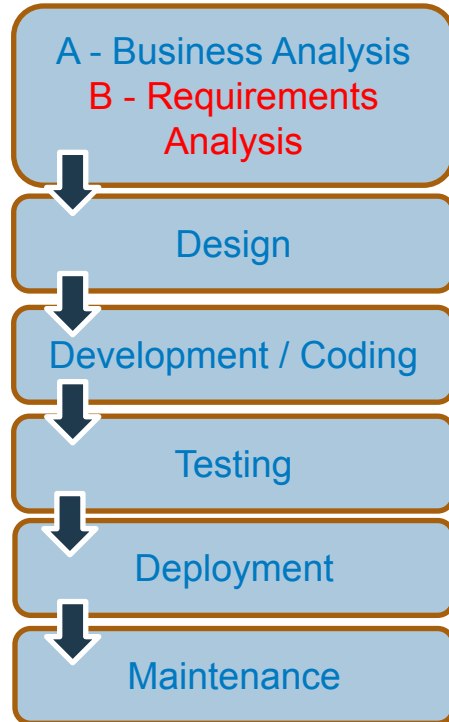
- Identify the Current State – Where are we now?
 - Understanding the current state allows us to identify the needs that need to be fulfilled by our project.

What is the current state?

- One bedroom apartment (we now have 2 kids).
- Limited closet space.
- High rent (more than a mortgage).
- Small kitchen (would like more space).
- One bathroom servicing 4 people.
- No parking space.
- No privacy.
- No place for the kids to play.
- Too many people in neighborhood.



1B – Requirements Analysis



The second half of analysis is the **Requirements Analysis or Requirements Gathering**.

Customer describes what they want and how they want it used.

Failure in this stage will result in incomplete or mis-directed work in all following stages.

Customers will ask for what they WANT

We need to have a clear understanding of:

- What we **want** to have (desire to have – initial plans).
- What we **must** have (absolutely necessary).
- What is just **gravy** (extra stuff – not expected enhancements).

We need to have a picture in mind.

Often – The customer's WANTS will be unrealistic.



SAMUEL

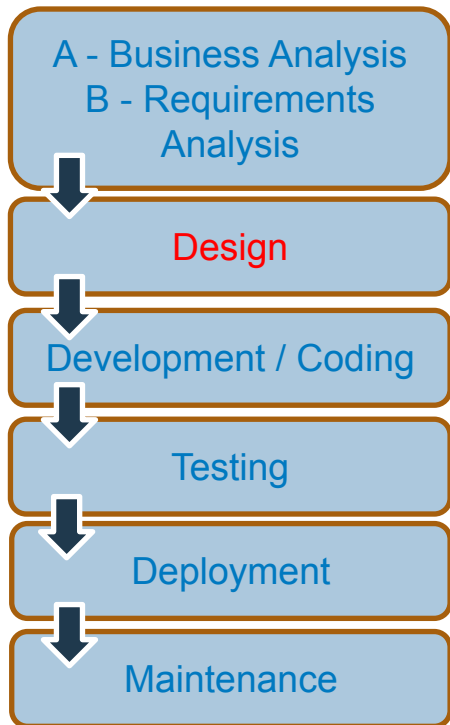


“WANTS vs. NEEDS”

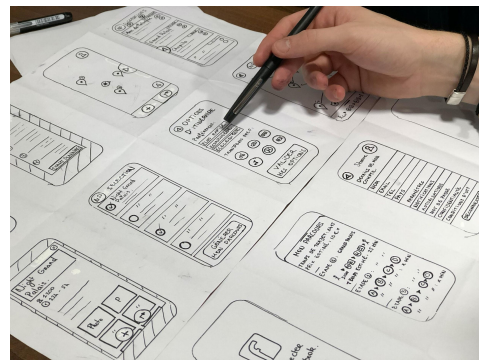
and

“CAN or WILL PAY FOR”

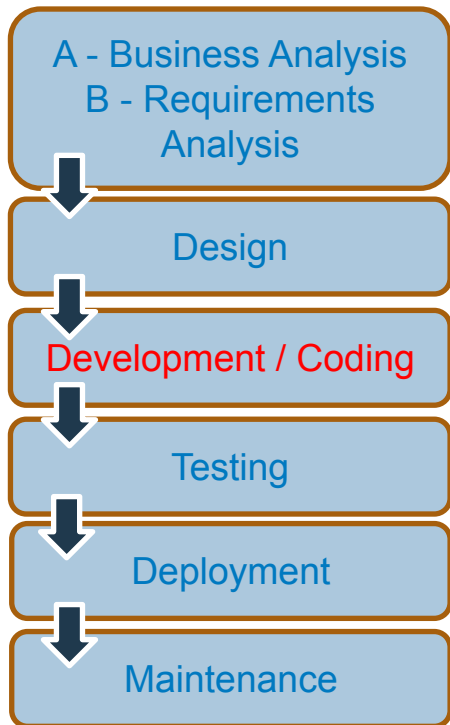
High Level Design vs. Low Level Design



- High Level Design (HLD) - lists the functional aspects of the various modules along with the final result.
- Low-Level Design (LLD) - details the logic and execution of each module in an HLD.



Development/Coding



Now that we have a clear understanding of how the application is supposed to work, it is time for our team of programming experts to begin coding.

Programming tools like compilers, interpreters, and language such as COBOL, C, C++, and Java are used for coding with respect to the type of application.



Testing

A - Business Analysis
B - Requirements Analysis



Design



Development / Coding



Testing



Deployment



Maintenance



Software Quality is best determined by how well the software meets the requirements.

Testing: Validating Functionality



Know how your product/service will perform in a live environment prior to releasing it into a live environment.

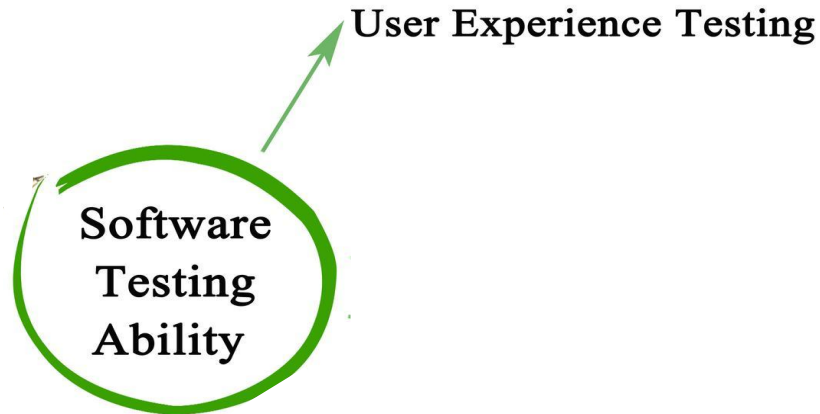
Plumbing	Yes	No
Do the toilets flush properly (do they run or leak)?		
Do the sinks, bathtubs and showers drain properly?		
Is the water pressure sufficient?		
Are there signs of leaking near faucets?		

HVAC	Yes	No
Does the heating system work properly?		
Does the air conditioning unit work properly?		
Does the thermostat work?		

Windows/Doors	Yes	No
Are there any signs of condensation or fog near double-pane windows?		
Are any windows broken or missing screens?		
Do all windows open and close properly?		



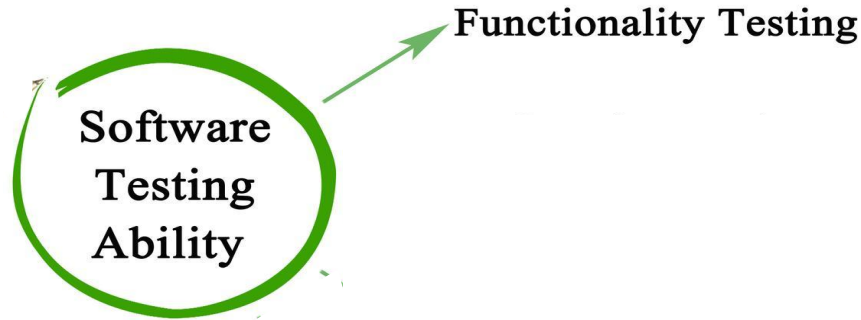
Software Testing – Other Types of Tests



How easily can users
utilize this functionality?



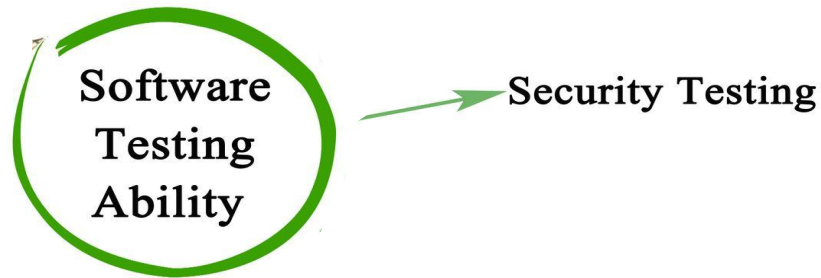
Software Testing – Other Types of Tests (continued)



Does this app perform the work needed as designed?

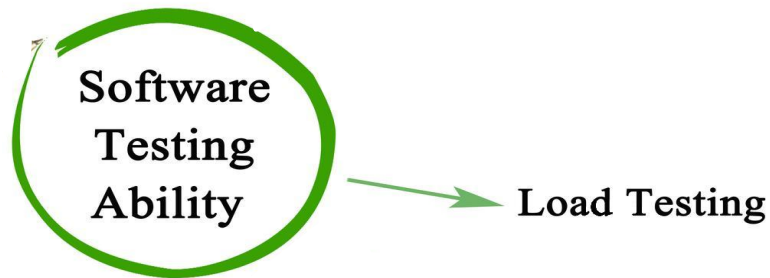


Software Testing – Other Types of Tests (continued)



Does this release meet the customer's acceptable risk profile?

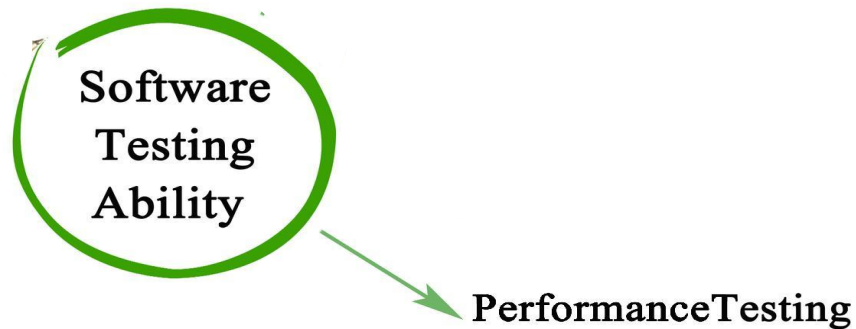
Software Testing – Other Types of Tests (continued)



Will this service be able to support (x) number of users and maintain acceptable levels of performance?



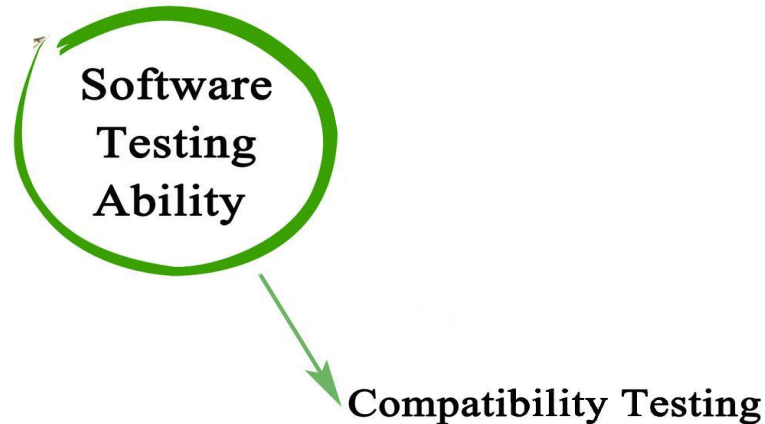
Software Testing – Other Types of Tests (continued)



Will performance in a live environment meet the planned performance from the blueprint?



Software Testing – Other Types of Tests (continued)



- What effect on the live environment will this service have once it is released?
- Will any other live services be adversely impacted by this new introduction?

End-User Preparation/Training



- End-users must be trained in how to interact with new systems prior to the new rollout.
- Not having users ready to interact with the new system is a major risk to a successful implementation.

Deployment

Deployment moves the product/service into the “live” environment. Once deployed successfully, customers and users can be allowed to begin utilization of the functionality provided.



Example



Once customers and users have access to the functionality in a live environment, any undiscovered issues will show up as incidents, directly affecting the customer/user experience.

Incidents may cause customers to have a negative perception of both the service/product and of the organization providing the service/product.



Maintenance

The **Maintenance** phase is an ongoing process.

- Maintenance of Hardware/Software.
- Updates.
- Upgrades.
- New Features.



Home Improvements and Repair

A home is never completed. There are always repairs to be made. And because families change, whether kids grow up and go away to college or new kids are born, the home changes. And we are always thinking of ways to make our home more valuable by making additions.

Mowing the Lawn



Adding some Kitchen Tiles

Shelving for Garage



Painting the kid's Room



End of Module



Test Your Knowledge

1. Enhancements, upgrades, and bug fixes are done during the _____ step in the SDLC?
 - a. Problem Identification
 - b. Design
 - c. Development
 - d. Maintenance
2. The difference between High-Level Design (HLD) and Low-Level Design (LLD) is that HLD contains architectural diagrams of overall components, while LLD consists of thorough descriptions and details.
 - a. True
 - b. False
3. Determining user expectations happens during which phase of SDLC?
 - a. Design
 - b. Maintenance
 - c. Requirements Analysis
 - d. Testing



Hands-On Exercise

Scope:

This exercise is to prepare students for interviewing a SME (Subject Matter Expert), in order to obtain information related to business requirements. This will be a group exercise and the following skills will be assessed:

- **Leadership qualities.**
- **Coverage of the application.**
- **Teamwork.**
- **Creativity in getting SME to give useful requirements.**
- **Identification of Functional and Non-Functional requirements.**