Software Testing and the Development Process

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Software Development Team

Software engineers are responsible for designing and programming system-level software.

They develop operating systems, database systems, and embedded systems, possessing in-depth knowledge of both software and hardware

The **product owner** is typically a lead user of the system or an individual from marketing, product management, or anyone with a strong understanding of users, the marketplace, competition, and future trends

Business analysts are key players who bridge the gap between technology experts, business managers, and end-users

Their primary role is to identify opportunities for improving processes and operations through the use of information technology

Project managers play a crucial role in orchestrating people, time, and resources to ensure the successful completion of IT projects.

They are responsible for meeting stated requirements, staying within specified budgets, and adhering to project timelines

Software testers try to anticipate all the ways an application or system might be used and how it could fail.

Testers prepare test scripts and analyze results, which are fed back to the project leader so that fixes can be made

Who is responsible for testing?

- This is a favorite interview question!
- Answer:
  - "All team members" are responsible for the quality of the software
  - The main goal of the team is to deliver a high-quality product efficiently and within a short time
  - Every team member should focus on quality with the guidance of the software tester

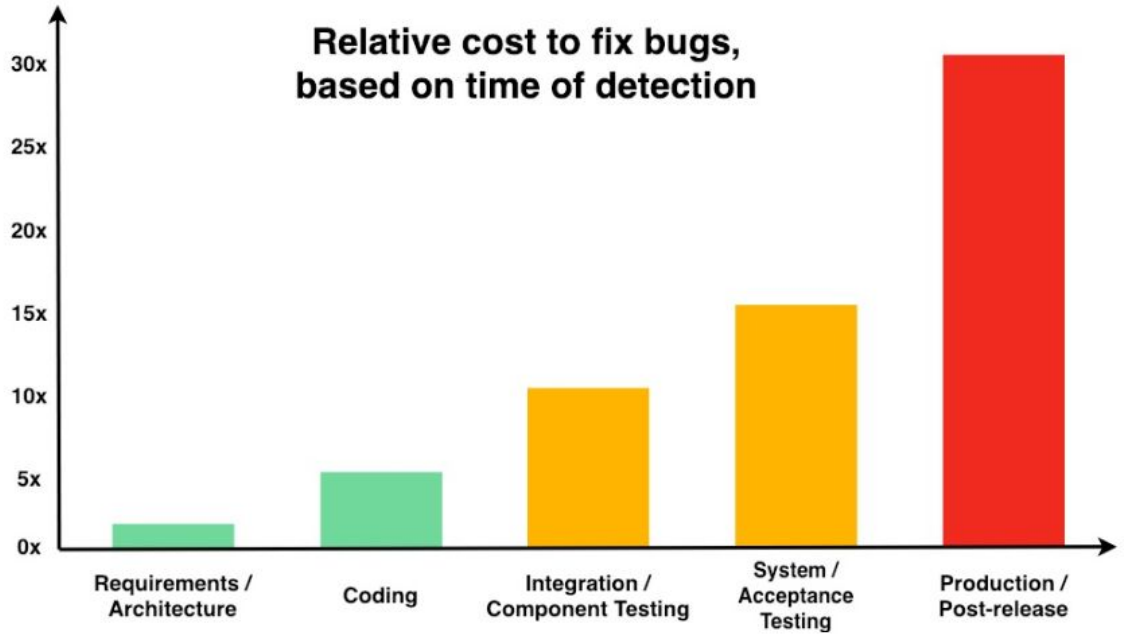
Cost of fixing bugs early

If we discover a bug during the testing phase:

Cost: The cost of retesting bug fixes and finding bugs

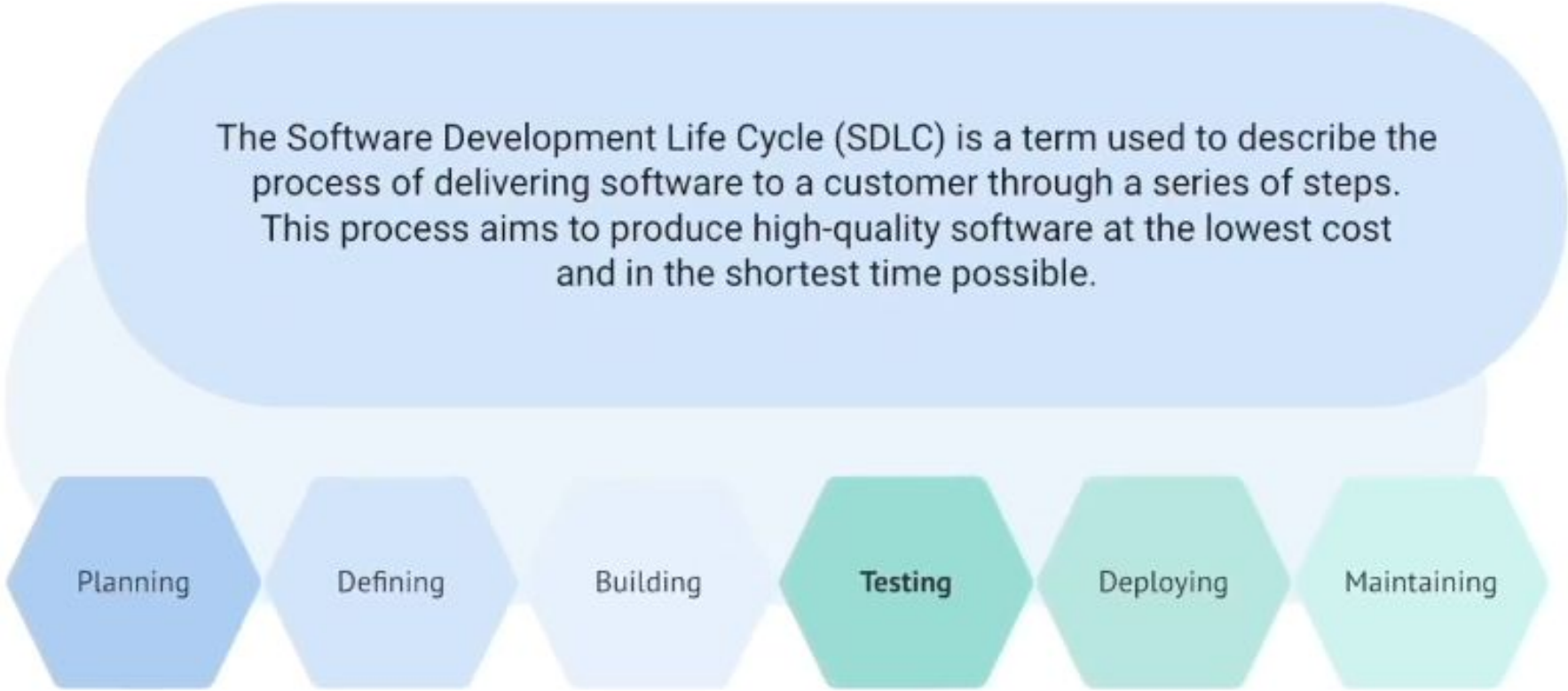
Issue is found in the final product:

Cost: customers finding bugs, help desk support, escalations, bug fixes, retesting, and redeploying

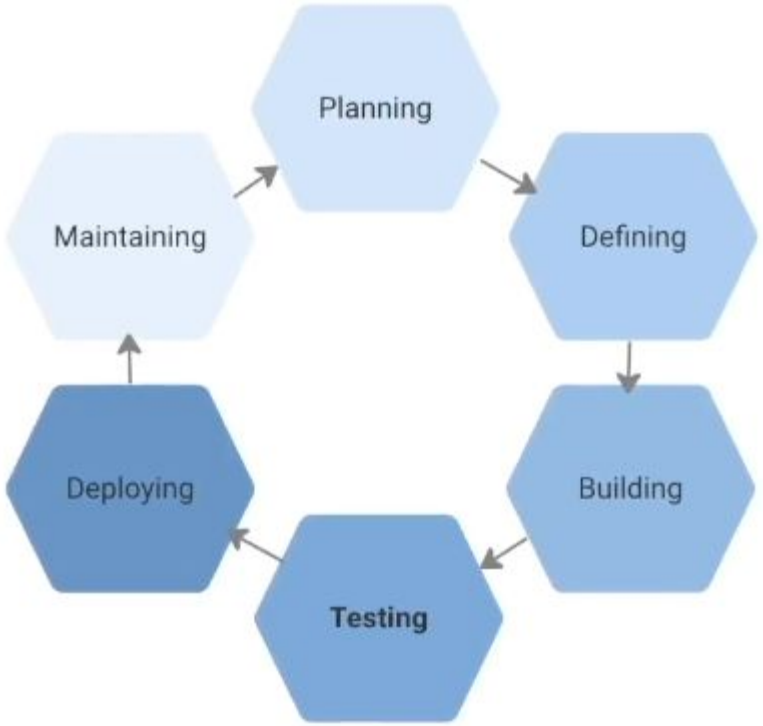


The role of software testing

Software Development lifecycle



Iterative software Development



Software testers are involved in all stages!

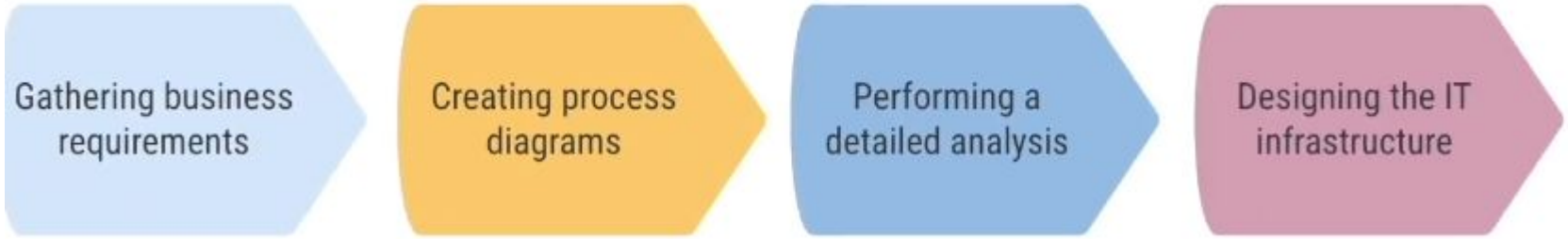
Responsibilities during the planning phase:

Planning: During the planning phase, the team answers the question, "What do we want?"

- Collaboration with stakeholders: Testers collaborate with stakeholders, such as project managers, developers, and business analysts.
- Test strategy and planning: Testers contribute to the development of a test strategy that outlines the overall approach to testing.
- Test effort estimation: Testers assist in estimating the time and resources required for the testing activities
- Risk analysis: Testers participate in risk analysis sessions to identify potential risks associated with the software and plan mitigation strategies.

The analysis/defining phase

Defining: In the defining phase, the team answers the question, "How will we get what we want?"



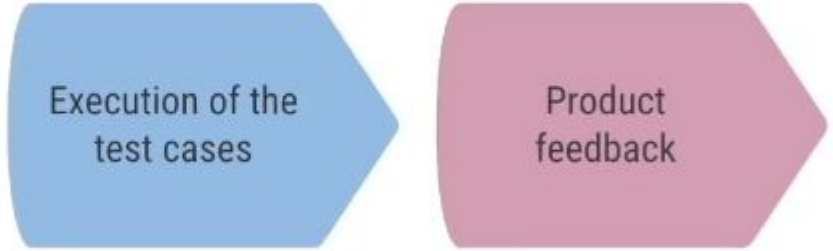
- Reviewing and analyzing requirements: Testers analyze the requirements and specifications to identify any ambiguities, inconsistencies, or potential issues.
- Developing testable requirements: Testers help to create testable requirements by ensuring that they are clear, concise, and measurable.
- Test effort estimation: Testers assist in estimating the time and resources required for the testing activities

Building/Development Phase

Building: Developers write the actual code, transforming the documents from the previous phase into the actual system.

Testing Phase

Testing: In the testing phase, the team asks, "Did we get what we want?"



Deployment and maintenance phase

- Deployment Phase: in this phase, the product is shared with customers and potential users:
  - Acceptance testing
  - System monitoring and bug fixing
  - Real users and real data can reveal new errors.
- Maintenance Phase:
  - Very long phase.
  - System monitoring and big fixing
  - New features re-testing

Overall Testing Activities

Testing is involved in every part of the software development life cycle, from planning to deployment. The main testing activities are:

- **Planning**
- **Specification**
- **Execution**
- **Test Completion**

Testing Activities

Test Planning: Before starting the tests, the tester should plan what and how to test the software

A "Test Plan" is a document describing the software testing scope and activities

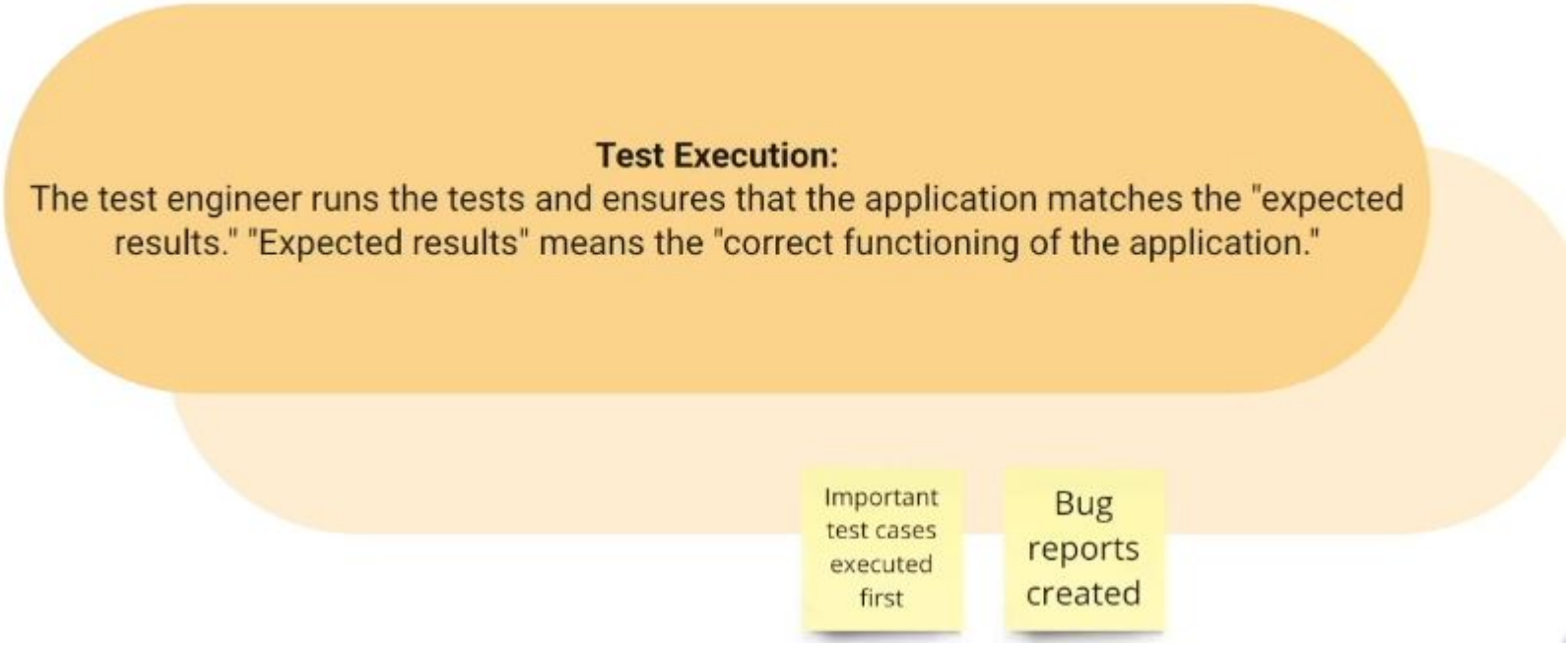
Identifies: features to be tested, testing tasks, testing environments, testing design, entry and exit test criteria

Testing Activities

Test Specification:
Design test cases – This involves determining 'how' the identified test conditions will be exercised

Build test cases – This step focuses on implementing the test cases by creating the necessary scripts, data, and other resources required for executing the tests.

Testing Activities



Testing Activities

Test Completion: Test engineer should be confident that all testing activities have been completed successfully, all high-level "bugs" have been resolved, and the product is ready for delivery

Final evaluation of the test process may be conducted to identify areas for improvement

Apply lessons learned to future projects