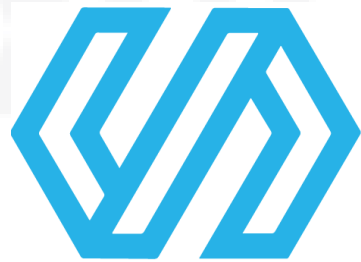


Why do we test?



SKILLO

Agenda

1. Quality, Quality Assurance, Quality Control and Testing
2. Expected result vs. actual result
3. What is a bug?
4. Software Development Life Cycle
5. Specification

What is Quality?

Definitions of Quality:

By ISTQB:

The degree to which a component, system or process meets specified requirements and/or user/customer needs and expectations.

By IEEE:

- *The degree to which a system, component, or process meets specified requirements.*
- *The degree to which a system, component, or process meets customer or user needs or expectations.*

What is Quality?

Other definitions:

1. *Quality is when the product or process fit for its purpose.*
2. *Quality is conformance to requirements*
3. *Quality is the price consumers are willing to pay for a product or service*

Standardization organizations

Audit

Standardization organizations

- **ISO** (International Organization for Standardization)
- **IEC** (International Engineering Consortium)
- **IEEE** (Institute of Electrical and Electronics Engineers)

QA fundamental definitions

Quality Assurance:

A set of activities designed to ensure that the development and/or maintenance process is adequate to ensure a system will meet its objectives. (PREVENTION)

Quality Control:

A set of activities designed to evaluate a developed work product. (DETECTION)

Testing:

The process of executing a system with the intent of finding defects. (DETECTION)

Testing ≠ Debugging

TESTING	DEBUGGING
Finding and locating of a defects in a Testing phase	Isolating and fixing a defects
Done by Testing Team	Done by Development Team
To find as many defects as possible	To remove the defects

7 principles of testing

1. Testing shows presence of defects
2. Exhaustive testing is impossible
3. Early testing
4. Defect clustering
5. Pesticide paradox
6. Testing is context depending
7. Absence of errors fallacy

Expected and Actual results

Expected Result

- specification
- life experience, common sense, communication, standards, statistics, valuable opinion etc.

Actual Result

- test the software
- observe how it behaves

When Expected \neq Actual mark as Bug

Expected and Actual results

Example from specification document:

When the user fills correct username and password and clicks login button it is redirected to the Homepage....

Expected result:

The user is redirected to the Homepage and sees its profile name and picture

Actual result:

When click login button Error 500 is shown

Expected and Actual results

Other sources of Expected result:

- Life experience - Life long learning
- Common sense - Result of logical thinking and life experience
- Communication - Extremely important !
- Standards - Industry standards, Internal company standards
- Statistics - Customer habits (performance, browser usage)
- Valuable opinion – Domain experts, Stakeholders

What is a bug?

1. Bug/Defect/Fault

- A flaw in a component or system that can cause the component or system to fail to perform its required function, e.g. an incorrect statement or data definition. A defect, if encountered during execution, may cause a failure of the component or system.
- A bug is a deviation of an actual result from an expected

What is a bug?

3 conditions of a bug

- We know the expected result
- We know the actual result
- The actual result deviates from the expected result

Why we call it “Bug”?

Bug or Not a Bug?

Different viewpoints

The opinions:

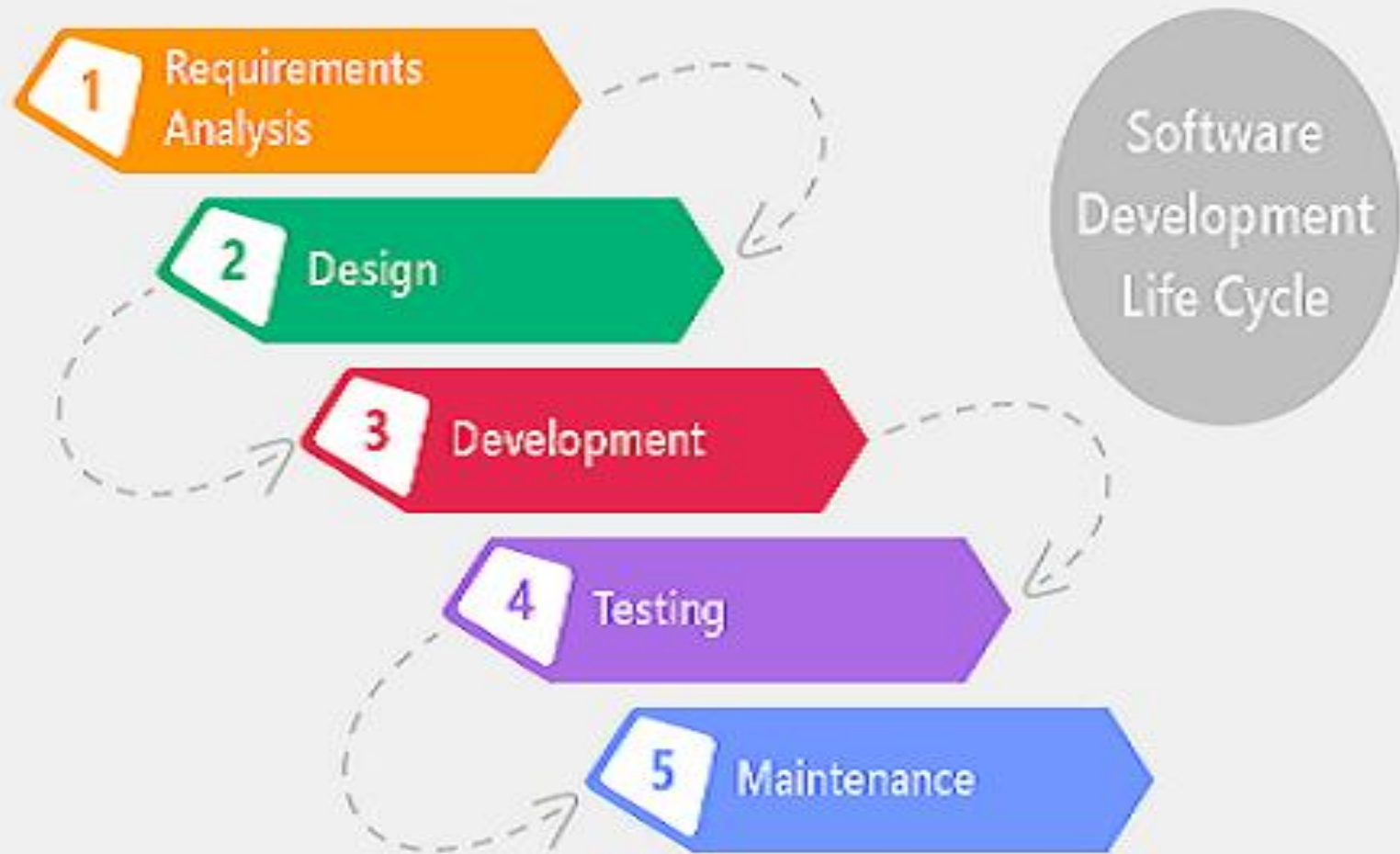
- Developers
- QA's
- Product owner

**QA: Is This a Bug or
Feature?**

PO: Yes



SDLC

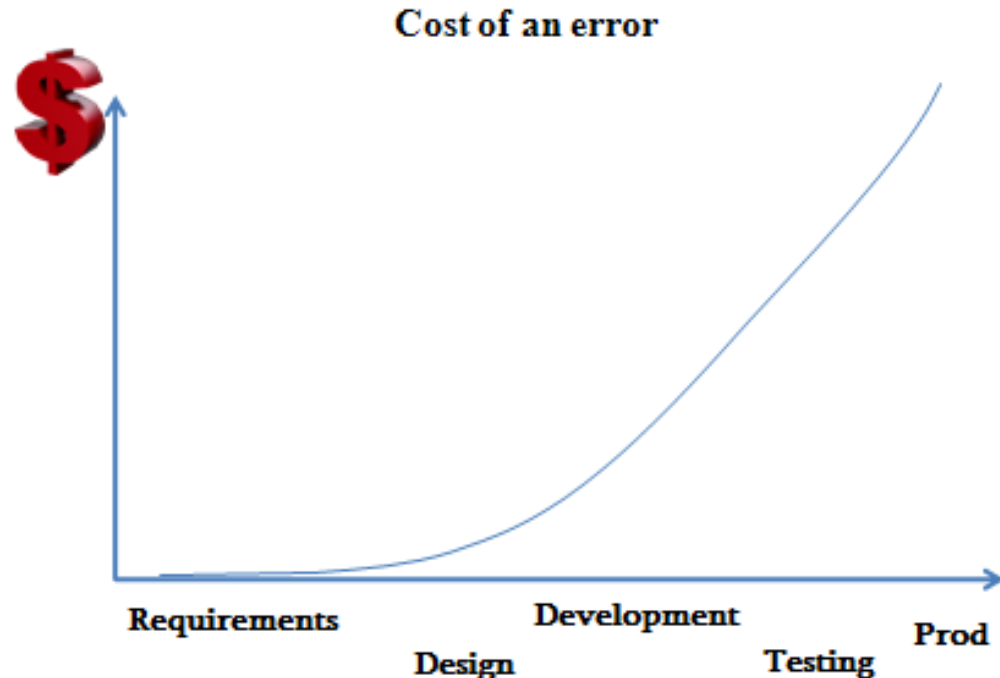


Cost of errors

The later the fault is found, the higher the cost is.

Small error in specification can result in huge error in production

Error in production can ruin the company



Examples

1. NASA'S MISSING HYPHEN

The damage: \$80 million

2. Therac-25 – the deadly radiation therapy

The damage: 3 people died directly from the overdose

3. Mazda CX-3 – adaptive cruise control fail

Cause of Errors

Human mistakes

- No one is perfect!
- We all make a mistakes or omissions

Aggressive schedules and pressure

- deadlines to meet

Communication

- poor communication in the team

Cause of Errors

Documentation

- Unclear and missing documentation

Assumptions

Specifications

- Description of how software should work/look
 - A document that specifies, ideally in a complete, precise and verifiable manner, the requirements, design, behavior, or other characteristics of a component or system, and, often, the procedures for determining whether these provisions have been satisfied. [IEEE 610]

Specifications

- Different types of documents
 - Use cases, User Stories, Technical Design, Mock-ups, Wireframes
- Bug in specification
- Lack of specification

Specifications

Specification Describes:

- Functionality
- Product design
- Performance requirements
- System architecture

Specifications

User Story

- Sentence format
- End user language - As user I want to be able to achieve X.
- End user needs
- Maintains end user contact
- Cheap to maintain

Specifications

Example of User Story

As a student, I can find my grades online so that I don't have to wait until the next day to know whether I passed.

Acceptance Criteria:

Exercises

1. Review of specification and find bugs, raise questions
2. Lack of specification
3. Mark bugs on a given page

Homework

1. Read Software Testing Terminology Document. Get it from Lecture 1 in Moodle

Q & A

THANK YOU