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Software testing

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Definitions

Error (Mistake)
Human action that produces incorrect result, e.g. developer misunderstand requirement.

Bug, defect, fault
An imperfection or deficiency in a work product that can cause the product to fail to perform a required function, e.g. there is something wrong in the code causing incorrect behaviour

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<li><a href="index.html">Home</a></li>
<li><a href="home-events.html">Home Events</a></li>
<li><a href="multi-col-menu.html">Multiple Column Menu on Larger Viewport
<li class="has-children"> <a href="#" class="current">Header Options</a>
  <ul>
    <li><a href="tall-button-header.html">Tall Button Header</a></
    <li><a href="image-logo.html">Image Logo</a></li>
    <li class="active"><a href="tall-logo.html">Tall Logo Image</
  </ul>
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<li class="has-children"> <a href="#">Carousels</a>
  <ul>
    <li><a href="variable-width-slider.html">Variable Image Wi
    <li><a href="testimonial-slider.html">Testimonial Slider<
    <li><a href="featured-work-slider.html">Featured Work Sli
    <li><a href="equal-column-slider.html">Equal Column Slid
    <li><a href="video-slider.html">Video Slider</a></li>
    <li><a href="mini-bootstrap-carousel.html">Mini Slider<
  </ul>
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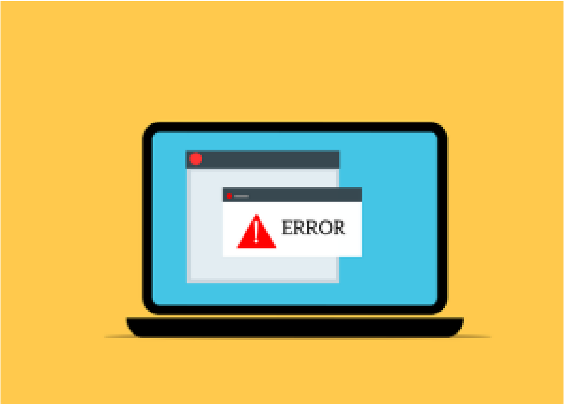

Failure
The inability of a system or component to perform a required function within specified limits, e.g. application crashes

Testing

- When testing begins, the tester assumes that the software contains defects
- If no defects are found, the testing may have failed and should be repeated, for example by using different test cases and different test data
- A good tester finds defects in the software and is able to describe them so that others can be informed and the defects can be fixed
- A good tester is able to present the defects constructively, to avoid confrontation or blame
- Testing is, in principle, always somewhat destructive in nature, because the tester aims to demonstrate that there are defects in the software

Finding defects in Software

- Defects are most likely to be found in software when the following principles are followed during testing
  - o Testing is started early
  - o Testing is systematic
  - o Testing is persistent
  - o Testing is diverse and creative, such as using different usage scenarios, different environments, and unusual inputs, etc .
  - o Tests are repeated, because some defects do not always appear; they may show up in different ways, randomly, or in different usage situations or environments

Finding defects in Software

- More testing principles that help in finding defects

  o Defects are often found in parts of the software that are complex

  o Many defects can be found in certain parts of the software; if one part has many defects, it is likely that more will be found in the same part

  o For example, when testing software that uses databases and files, you should not blindly trust what is shown in the user interface (with glass box testing, you can ensure that the information shown in the UI is correct)

  o Defects are often found in parts of the software that have just been modified

  o The tester focuses on testing and recording defects (fixing is left to the programmer)

The impact of software type on testing

- In software testing, it is also important to consider the type of software, as it affects how the software is used and, consequently, the types of defects that may occur
- Different types of software include
  - Applications used via a web browser, which can be accessed on various device
  - Mobile applications downloaded from app stores (smartphones and tablets)
  - Desktop applications installed on desktop and laptop computers
  - Games (a world of their own)
  - …

Testing various inputs

- If testing involves an input field, the tester should consider the types of inputs based on the type of the input field. Examples of different types of input fields
    - Characters and strings
    - Numeric inputs (integers, decimals, etc.)
    - Dates
    - Times
    - Currencies
    - File names
- Boundary checking (value is on valid range) in also important

Reporting results

- Reporting of testing is a part of software development
- Reporting can be formal or informa
- The method and extent of reporting depend, among other things, on the following
    - o The project and the software being developed
    - o The phase of the project
    - o The type of testing
    - o The stage of testing
- here are various tools available for reporting

Reporting results

- Defects found during testing are recorded as tickets
- Information about defect might include
  - Date and time
  - Origin
  - Description
  - Recurrence
  - Severity
  - Tester
  - Additional information (logs, screenshot, etc.)
  - Environment (OS, hardware, etc.)
  - Assigned to (who does the fixing)
  - Estimated time to fix (estimation by developer)
  - Status (updated)
  - Actual time spent on fix

Test summary report

- Assessment of the success of testing
- Based on the report, the quality of the software and its readiness for release can be evaluated
- Main parts of the report
  - o Background information
    - - Project, developed software, reference documentation
  - o Information about the testing
    - - Number of tests, number of passed tests, number of failed tests, number of failed tests based on severity, …

Challenges

- If the software needs to work in different environments, on different devices, and with different browsers, the amount of reported information increases
- Information for the report can come from several different sources, such as individuals, teams, or testing tools
- Short release cycles (especially in agile projects)
    - Reporting should be agile, so it does not take too much time
    - Total amount of testing data (in project) can be very large, which is challenging

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