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Chapter - 9

Testing Web & Mobile Application

Web Testing:

- Web testing focuses on web applications.
- It is better to completely test a web-based system before going live.
- Issues such as:
  - security of the web application
  - basic functionality of the site
  - accessibility to handicapped users and fully able users.
  - readiness for expected traffic ↕ load testing.
  - ability to survive user traffic.

- A web ~~applicable~~ application performance tool (WAPT) is used to test web applications and web related interfaces.
- These tools are used for performance, load and stress testing of web applications, web sites, web servers and other web interfaces.
- The tools is useful to check for bottleneck and performance leakage in the website or web application being tested.
  - Browser compatibility
  - Operating system compatibility.
  - windows application compatibility.

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Testing methods for Web Application Testing:-

Testing Techniques for web application testing are:

1) Functional Testing
- It includes checking all the links of the webpages.
- It also includes form testing, cookie testing and database connection testing.

2) Usability Testing
- This testing checks the navigation and user friendliness of the web pages.
- It ensures whether the content is properly checked and is easily understandable to the users.
- It checks whether the anchor text links are working properly.

3) Interface Testing
- This checks if the web server and application server interface, application server and database server interface have proper interaction or not.

4) Compatibility Testing
- This checks if the web server and application server

4) Compatibility Testing:
- This checks browsier compatibility, operating system compatibility, mobile browsing and printing options.

5) Performance Testing:
- This performs web load testing, web stress testing.
- It checks if many users can access the same page at the same time and whether a web page can handle heavy load on any specific page.

6) Security Testing:
- This checks the security of the web applications. For security purposes, internal pages should not open if we are not logged into the website.
- CAPTCHA for automated scripts logins and SSL should be tested for security measures.

After completing all the web application testing, a live testing is necessary for web based applications and websites.

In web application,
i) Numerous Application Usage (Entry-Exit) paths are possible
ii) People with varying backgrounds & technical skills may use the application.

iii) Even on the same browser, applications may be executed differently based on local issues such as screen resolution / hardware / software configuration of the system.

Problems in Web application:
- Injection (SQL Injection)
- Cross site scripting
- Invalid Redirects and Forwards.
- Poor redirect & query Pass
- Sensitive Data Exposure.
- DOS

Mobile Application Testing
- It is a process by which application s/w developed for hand held mobile devices is tested for its functionality, usability and consistency.
- It can be both automated or manual.

Key challenges in Mobile Application Testing:-

1) Variety of Mobile Devices:-
- Mobile devices differ in screen sizes, input methods (QWERTY, touch, normal) with different hardware capabilities.

2) Diversity in Mobile Platforms / OS:-
- There are different Mobile Operating systems in the market. The major ones are Android, IOS etc.
- Each operating system has its own limitations.

3) Mobile Networks Operators:-
- There are over 400 mobile networks operators in the world. Out of which some are CDMA, some GSM (2G, 2G, 3G, 4G)
- Each network operator uses a different kind network infrastructure and this limits the flow of information.

4) Scripting:-
- As devices differ in input methods, menu structure and display properties, so a single script does not function on every device.

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Types of Mobile Application Testing:

1) Functional Testing:-
It ensures that the application is working as per the requirements.

2) Laboratory Testing:-
- This testing is performed to find out any glitches when a mobile application uses voice and/or data connection to perform some functions.

3) Performance Testing:-
- This testing checks the performance and behaviour of the application under certain conditions such as low battery, bad network coverage, low available memory etc.

4) Memory leakage testing:-
- Memory leakage testing is crucial for the proper functioning of an application.
- If the application in mobile devices unable to manage the memory it is allocated resulting in poor performance.

5) Compatibility Testing:
- Different version of OS, types, screen size.

6. Interrupt Testing:
- An application while functioning may face several interruption like incoming calls or network coverage outage and recovery.
- The different types of interruptions are:-
  - Incoming and outgoing SMS & MMS.
  - Incoming and outgoing calls.
  - Incoming Notifications
  - Battery Removal.
  - Cable insertion and Removal for data transfer
- An application should be able to handle these interruptions by going into a suspended state and resuming afterwards.

8. Usability Testing
- User ~~friend lines.~~ friendliness.

7. ~~Usability~~ Installation Testing
- It verifies that the installation process goes smoothly without the user having to face any difficulty.
- This testing process covers installation, updating and uninstalling of an application.

8. Certification Testing:-
- Each mobile ~~devices~~ application needs to be tested against the guidelines set by different mobile platforms.

Testing with Emulator vs. Testing with real devices.

1. Emulator covers full range of devices for testing where as Real device cover only few range of devices.

2. Emulators are often free, or offer low monthly user fee where as real device cost high.

3. Emulators can be adjusted to achieve different (any) screen size and resolution which cannot be done in real device.

4. Testing in emulator can be done by copying & pasting ~~~~ test data where as in real device it has to be entered by typing on the touch screen.

5. Capturing screenshots of UI is easier from emulator because this feature is developed in PC and is fast.

6. Emulator can extract data in real time which makes the development ~~easier~~ and fixing of bugs easier.

7. Memory issue cannot be correctly tested in Emulators.

8. The processor of the PC is ten times more powerful than that of a given android device. Even with constraints placed, the emulator can borrow the processing power to get the job done. This affects the testing for low end devices in emulator.

9. Many sensor issues cannot be tested via emulators.

10. Battery is a physical attribute of a ~~real~~ real phone and cannot be tested by an emulator.

11. It is easy to achieve multiple screen sizes and resolution, however an emulator does not give the information like brightness, saturation etc.

12. Emulators cannot deal with issues ~~such~~ obtained due to various interrupts such as phone, messaging or push notification interrupts.

13. Interaction with keyboard and mouse ~~in~~ in emulator is different from interacting with fingures in real device touch screen.

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