**PRACTICAL – 6**

**AIM**: List at least 10 type of Testing for software development life cycle in IT industry and Design Test Case, Test Suites & Testing Strategy for the “Gmail” Web Application & Mobile Application.

**THEORY**

Software Testing is a method to check whether the actual software product matches expected requirements and to ensure that software product is Defect free. It involves execution of software/system components using manual or automated tools to evaluate one or more properties of interest. The purpose of software testing is to identify errors, gaps or missing requirements in contrast to actual requirements.

Types of testing:

* Unit Testing
  + It focuses on the smallest unit of software design. In this, we test an individual unit or group of interrelated units. It is often done by the programmer by using sample input and observing its corresponding outputs.
* Integration Testing
  + The objective is to take unit tested components and build a program structure that has been dictated by design. Integration testing is testing in which a group of components is combined to produce output.
  + Integration testing is of four types: (i) Top-down (ii) Bottom-up (iii) Sandwich (iv) Big-Bang
* Regression Testing
  + Every time a new module is added leads to changes in the program. This type of testing makes sure that the whole component works properly even after adding components to the complete program.
* Smoke Testing
  + This test is done to make sure that software under testing is ready or stable for further testing
  + It is called a smoke test as the testing an initial pass is done to check if it did not catch the fire or smoke in the initial switch on.
* Alpha Testing
  + This is a type of validation testing. It is a type of acceptance testing which is done before the product is released to customers. It is typically done by QA people.
* Beta Testing
  + The beta test is conducted at one or more customer sites by the end-user of the software. This version is released for a limited number of users for testing in a real-time environment.
* System Testing
  + This software is tested such that it works fine for the different operating systems. It is covered under the black box testing technique. In this, we just focus on the required input and output without focusing on internal working.
  + In this, we have security testing, recovery testing, stress testing, and performance testing.
* Stress Testing
  + In this, we give unfavourable conditions to the system and check how they perform in those conditions.
* Performance Testing
  + It is designed to test the run-time performance of software within the context of an integrated system.
  + It is used to test the speed and effectiveness of the program. It is also called load testing. In it we check, what is the performance of the system in the given load.
* Object-Oriented Testing
  + This testing is a combination of various testing techniques that help to verify and validate object-oriented software. This testing is done in the following manner:
    - Testing of Requirements,
    - Design and Analysis of Testing,
    - Testing of Code,
    - Integration testing,
    - System testing,
    - User Testing.
  + We use this OOT, for discussing test plans and for executing the projects.

**TEST SUITE-1 FOR “GMAIL” Web Application & Mobile Application:**

**Test suite Summary:**

For application such as GMAIL which is going to be used as email service, we have divided the test cases into two parts. This test suite will contain test cases related to Inbox functionality.

**Test suite Design:**

This test suite is designed for both Web application and mobile application. The pre-condition and post-conditions of web application and mobile application are listed together and expected output were merged with test cases table. Only one screenshot is presented in document section as the main screen of testing software.

**Pre-conditions:**

The preconditions to test the GMAIL is listed below.

* You need to have a web browser for web application.
  + Supported browsers for web application:
    - Google chrome
    - Firefox
    - Safari
    - Internet Explorer or Microsoft Edge
* For inbox functionality testing, you need to login to the GMAIL with valid credentials.
  + If you don’t have credential, you can register yourself to get them.
* It is mandatory to have internet connection to connect your device with the server.
  + Good internet connection should yield faster result.

**Post-conditions:**

* The log-out functionality should work after the completion of testing.
* The backend should perform garbage collection after session completion.
* The connection with the database should be successfully released.

**Risk assessment/Analysis:**

Email risk assessment is the practice of validating a potential customer's email address against information about that person that exists online.

* Reverse Email Lookup:
  + Email background checks, also known as reverse email lookup, let you check personal information about customers by searching public databases and social networks for links.
* Sending malware using mail:
  + Email viruses, which constitute the majority of computer viruses, consists of malicious code that is distributed in email messages, and it can be activated when a user clicks on a link in an email message, downloads an email attachment or interacts in some other way with the body of an infected email.
* Sending suspicious URLs:
  + If the domain of a shortened URL is blacklisted, URLs are considered suspicious. So, avoid publicly available blacklisted URL shorteners. URLs should not be used to seek personal information such as email address, passwords, residential address, phone number, and credit card information.
* Overloading of spam:
  + Email spam, also referred to as junk email, is unsolicited messages sent in bulk by email (spamming).

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| Test Case | Expected Result |
| Verify that on clicking ‘compose’ button, a frame to compose a mail gets displayed. | A compose screen should be visible. |
| Verify that user can enter email ids in ‘to’, ‘cc’ and ‘bcc’ sections and also user will get suggestions while typing the emailds based on the existing emailids in user’s email list. | Different input boxes should be displayed for ‘TO’, ‘CC’ and ‘BCC’ and while typing suggestions should be seen. |
| Verify that the user can enter multiple comma-separated emailids in ‘to’, ‘cc’ and ‘bcc’ sections. | Multiple inputs should be accepted. |
| Verify that the user can type subject line in the ‘subject’ textbox. | ‘SUBJECT’ textbox should accept any text. |
| Verify that the user can type the email in the email-body section. | Body should be able to hold upto 384000 characters. |
| Verify that users can format mail using editor-options provided like choosing font-family, font-size, bold-italic-underline, etc. | Fonts should be customized. |
| Verify that the user can attach file as an attachement to the email. | The file should be shown as attachment. |
| Verify that the user can add images in the email and select the size for the same. | The custom image from user’s device or from URL should be attached. |
| Verify that sent mails can be found in ‘Sent Mail’ sections of the sender. | ‘Sent mail’ should have sent mail. |
| Verify that mail can be sent to non-gmail emailIds also. | Mail should be sent to different domains too. |
| Verify that the emails composed but not sent remain in the draft section. | The ‘draft’ section should contain that mail. |

**TEST SUITE-2 FOR “GMAIL” Web Application & Mobile Application:**

**Test suite Summary:**

For application such as GMAIL which is going to be used as email service, we have divided the test cases into two parts. This test suite will contain test cases related to Compose mail functionality.

**Test suite Design:**

This test suite is designed for both Web application and mobile application. The pre-condition and post-conditions of web application and mobile application are listed together and expected output were merged with test cases table. Only one screenshot is presented in document section as the main screen of testing software.

**Pre-conditions:**

The preconditions to test the GMAIL is listed below.

* You need to have a web browser for web application.
  + Supported browsers for web application:
    - Google chrome
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    - Safari
    - Internet Explorer or Microsoft Edge
* For inbox functionality testing, you need to login to the GMAIL with valid credentials.
  + If you don’t have credential, you can register yourself to get them.
* It is mandatory to have internet connection to connect your device with the server.
  + Good internet connection should yield faster result.

**Post-conditions:**

* The log-out functionality should work after the completion of testing.
* The backend should perform garbage collection after session completion.
* The connection with the database should be successfully released.

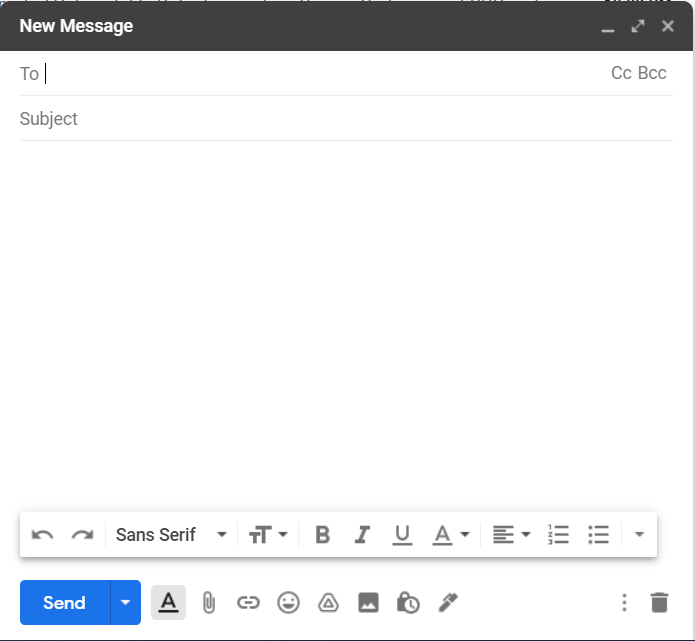
**Risk assessment/Analysis:**

Email risk assessment is the practice of validating a potential customer's email address against information about that person that exists online.

* Reverse Email Lookup:
  + Email background checks, also known as reverse email lookup, let you check personal information about customers by searching public databases and social networks for links.
* Sending malware using mail:
  + Email viruses, which constitute the majority of computer viruses, consists of malicious code that is distributed in email messages, and it can be activated when a user clicks on a link in an email message, downloads an email attachment or interacts in some other way with the body of an infected email.
* Sending suspicious URLs:
  + If the domain of a shortened URL is blacklisted, URLs are considered suspicious. So, avoid publicly available blacklisted URL shorteners. URLs should not be used to seek personal information such as email address, passwords, residential address, phone number, and credit card information.
* Overloading of spam:
  + Email spam, also referred to as junk email, is unsolicited messages sent in bulk by email (spamming).

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| Test Case | Expected Result |
| Verify that on clicking ‘compose’ button, a frame to compose a mail gets displayed. | A compose screen should be visible. |
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| Verify that the user can enter multiple comma-separated emailids in ‘to’, ‘cc’ and ‘bcc’ sections. | Multiple inputs should be accepted. |
| Verify that the user can type subject line in the ‘subject’ textbox. | ‘SUBJECT’ textbox should accept any text. |
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| Verify that users can format mail using editor-options provided like choosing font-family, font-size, bold-italic-underline, etc. | Fonts should be customized. |
| Verify that the user can attach file as an attachement to the email. | The file should be shown as attachment. |
| Verify that the user can add images in the email and select the size for the same. | The custom image from user’s device or from URL should be attached. |
| Verify that sent mails can be found in ‘Sent Mail’ sections of the sender. | ‘Sent mail’ should have sent mail. |
| Verify that mail can be sent to non-gmail emailIds also. | Mail should be sent to different domains too. |
| Verify that the emails composed but not sent remain in the draft section. | The ‘draft’ section should contain that mail. |

**Document:**



**TEST STRETEGY FOR “GMAIL” Web application & Mobile application**

**Scope:**

The Gmail or Google Mail is a free email service introduced by Google. It allows sending and receiving mails over the Internet.

We can also send an email to multiple users at a time. The Gmail site is a type of Webmail.

We can access the Gmail from Web and as an application in Mobile devices. We can also use the third-party program to access the Gmail. Such programs synchronize the email content through the protocols IMAP (Internet Message Access Protocol) or POP (Post Office Protocol).

This document will be approved by both the testing manager and the development managers.

**Test Approach:**

For email service such as GMAIL whose target audience is in wide range, the testing should be done in multiple ways to ensure better security.

We propose to use Unit testing, Integration testing, Alpha testing and Beta testing to be used for current version.

UNIT TESTING is a type of software testing where individual units or components of a software are tested. The purpose is to validate that each unit of the software code performs as expected. Unit Testing is done during the development (coding phase) of an application by the developers. Unit Tests isolate a section of code and verify its correctness. A unit may be an individual function, method, procedure, module, or object.

INTEGRATION TESTING is a level of software testing where individual units / components are combined and tested as a group. The purpose of this level of testing is to expose faults in the interaction between integrated units. Test drivers and test stubs are used to assist in Integration Testing.

But according to ISTQB Definition, integration testing is Testing performed to expose defects in the interfaces and in the interactions between integrated components or systems.

Alpha Testing is a type of software testing performed to identify bugs before releasing the product to real users or to the public. Alpha Testing is one of the user acceptance testing.

Beta Testing is performed by real users of the software application in a real environment. Beta testing is one of the type of User Acceptance Testing.

**Test Environment:**

A testing environment is a setup of software and hardware for the testing teams to execute test cases. In other words, it supports test execution with hardware, software and network configured. Test bed or test environment is configured as per the need of the Application Under Test.

For testing of Web application, we will use google Chrome browser with operating system either Windows 7 or higher, Linux or Mac.

For testing of Mobile application, we suggest to use android based operating system.

**Testing Tools:**

We are in an era of automation everywhere even in testing. So we will use some automated tools to perform testing. Though we will also use manual testing at places where it will be must.

We will use Selenium as testing tool.

Selenium is a testing framework to perform web application testing across various browsers and platforms like Windows, Mac, and Linux. Selenium helps the testers to write tests in various programming languages like Java, PHP, C#, Python, Groovy, Ruby, and Perl. It offers record and playback features to write tests without learning Selenium IDE.

Selenium proudly supports some of the largest, yet well-known browser vendors who make sure they have Selenium as a native part of their browser.

We will also use Watir.

Watir stands for Web Application Testing In Ruby. It facilitates the writing of automated tests by mimicking the behaviour of a user interacting with a website.

Watir is an open-source Ruby library for automating tests. Watir interacts with a browser the same way people do: clicking links, filling out forms and validating text.

**Release Control:**

This testing is defined for GMAIL latest web application and mobile application version 2021.02.21.361222438 which will be released in December 2019 and 9 March, 2021 respectively.

**Risk Analysis:**

Email risk assessment is the practice of validating a potential customer's email address against information about that person that exists online.

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  + Email background checks, also known as reverse email lookup, let you check personal information about customers by searching public databases and social networks for links.
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* Sending suspicious URLs:
  + If the domain of a shortened URL is blacklisted, URLs are considered suspicious. So, avoid publicly available blacklisted URL shorteners. URLs should not be used to seek personal information such as email address, passwords, residential address, phone number, and credit card information.
* Overloading of spam:

Email spam, also referred to as junk email, is unsolicited messages sent in bulk by email (spamming).

**CONCLUSION:**

In this practical, we learned about software testing. We learned about 10 widely used types of testing. We creates test cases and test suites for GMAIL which is one of the most famous email service around the world, we also wrote a test strategy for the same.