### **Test Plan**

#### **1. Introduction**

The purpose of this test plan is to validate the functionality of a registered user logging in from a new device, ensuring they are logged out from all other devices for enhanced account security. This includes validating user input, OTP verification, and notifications.

#### **2. Scope**

##### **In Scope:**

* User login flow from a new device.
* Input validation for phone number and password.
* OTP verification process.
* Successful login and redirection to the home page.
* Notifications (login success, SMS alerts).
* Automatic logout from all other devices.

##### **Out of Scope:**

* Multi-factor authentication settings beyond OTP.
* Account creation or password reset processes.
* Logging in from the same device.

#### **3. Objectives**

* Ensure the user can log in from a new device successfully.
* Validate that the system logs out the user from all other devices.
* Confirm the delivery of a login notification message (SMS) after successful login.
* Test proper redirection to the home page after login.

#### **4. Test Approach**

##### **Testing Levels:**

1. **Functional Testing:** Verify each step of the login process and logout mechanism.
2. **Integration Testing:** Test interactions between the UI, authentication system, and notification service.
3. **Negative Testing:** Check system behavior with invalid inputs (e.g., incorrect OTP, invalid phone number).
4. **Security Testing:** Verify secure handling of credentials and logout processes.
5. **Performance Testing:** Assess response times for OTP delivery and login success.

##### **Testing Types:**

* **Manual Testing:** For UI validations and edge cases.
* **Automation Testing:** For repetitive scenarios like input validation and notifications.

#### **5. Test Deliverables**

* Test Cases (Functional, Negative, Edge Cases).
* Test Execution Results.
* Defect Reports.
* Test Summary Report.

#### **6. Resources**

##### **Test Environment:**

* Web and Mobile Applications (Staging and Production Environments).
* Devices: iOS, Android, Windows, Mac.
* Browsers: Chrome, Safari, Firefox, Edge.

##### **Test Data:**

* User accounts (verified, unverified).
* Correct and incorrect phone numbers, passwords, and OTPs.

##### **Tools:**

* Selenium WebDriver (Automation).
* Postman (API Testing).
* JIRA (Defect Management).
* TestNG (Test Management).

#### **7. Roles and Responsibilities**

| **Role** | **Responsibility** |
| --- | --- |
| QA Lead | Create and review test plan and cases. |
| Test Engineers | Execute test cases, identify defects. |
| Developers | Fix defects, implement changes. |
| DevOps | Maintain test and production environments. |

#### **8. Risks and Mitigation**

| **Risk** | **Mitigation Plan** |
| --- | --- |
| OTP not delivered to the user. | Monitor SMS gateway logs and retry mechanism for OTPs. |
| User not logged out from other devices. | Verify session termination across all devices. |
| Login fails due to high server load. | Conduct load testing to ensure system stability. |
| Credentials stored insecurely. | Test encryption and secure storage mechanisms. |

#### **9. Test Execution Plan**

##### **Phase 1: Functional Testing**

* Validate login flow: Input validation, OTP submission, and redirection to the home page.
* Verify successful logout from other devices.

##### **Phase 2: Negative Testing**

* Test with incorrect phone numbers, passwords, and OTPs.
* Test system behavior with expired or reused OTPs.

##### **Phase 3: Integration Testing**

* Ensure the OTP service, notification system, and login flow work together seamlessly.

##### **Phase 4: Security Testing**

* Validate data encryption during login.
* Ensure secure session handling and logout mechanisms.

##### **Phase 5: Performance Testing**

* Test system response times during high traffic for login and OTP delivery.

#### **10. Test Scenarios and Test Cases**

##### **Functional Test Cases**

1. Verify the "Login" button is clickable on the login page.
2. Validate that the system accepts only valid phone numbers and passwords.
3. Check OTP delivery to the registered phone number.
4. Verify login success with a valid OTP.
5. Ensure logout occurs on all other devices after a successful login.

##### **Negative Test Cases**

1. Attempt login with an unregistered phone number.
2. Enter incorrect or expired OTP and verify error messages.
3. Verify system behavior when OTP is entered multiple times incorrectly.

##### **Edge Cases**

1. Attempt login while already logged in on another device.
2. Check for timeouts or session expiry during login flow.
3. Validate system behavior for duplicate OTP requests.

#### **11. Test Closure**

* Verify all test cases are executed, and defects are resolved.
* Confirm the system meets the acceptance criteria.
* Document results in the Test Summary Report.

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### **Risk-Based Testing (RBT) Approach**

#### **1. Identifying Risks**

The primary risks associated with this user story include:

* **Critical Risks:**
  + Users unable to log in due to input validation or OTP issues.
  + Sessions not being logged out on other devices, leading to potential security risks.
  + SMS notifications not being sent, leading to unawareness of unauthorized access.
  + Login redirection failure.
* **Moderate Risks:**
  + Delays in SMS notifications.
  + UI/UX issues affecting user flow.
  + Multiple failed login attempts blocking the user (lockout scenarios).
* **Low Risks:**
  + Minor typos in error messages.
  + Performance issues under load (e.g., OTP delays, session termination delays).

#### **2. Prioritizing Risks**

Based on severity and likelihood:

* High Priority: Critical risks (security, functionality).
* Medium Priority: Moderate risks (usability, performance).
* Low Priority: Cosmetic or minor issues.

### **Test Cases for Each User Story (Acceptance and Edge Cases)**

#### **Test Suite 1: Login Functionality**

##### **Acceptance Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC01 | Login with valid phone number, password, and OTP | High | User logs in successfully, SMS notification is sent, and other devices are logged out. |
| TC02 | Attempt login with incorrect phone number | High | Error: "Invalid phone number." |
| TC03 | Attempt login with incorrect password | High | Error: "Incorrect password." |
| TC04 | Login with expired OTP | High | Error: "OTP has expired." |
| TC05 | Successful redirection after login | High | User is redirected to the home page. |

##### **Edge Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC06 | Login attempt with multiple failed OTPs | Medium | Account temporarily locked after a defined number of failed attempts. |
| TC07 | Login without entering phone number or password | Medium | Error: "Phone number and password are required." |
| TC08 | Session timeout during login | Medium | Error: "Session expired. Please try again." |
| TC09 | Simultaneous login attempts from two devices | High | Only one device is logged in, and other device receives a "Session Expired" message. |
| TC10 | Login when the SMS gateway is unavailable | High | Fallback mechanism triggers or appropriate error message is displayed. |

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#### **Test Suite 2: OTP Functionality**

##### **Acceptance Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC11 | Receive OTP after entering valid phone number | High | OTP is sent to the registered number. |
| TC12 | Validate incorrect OTP entry | High | Error: "Invalid OTP. Please try again." |
| TC13 | Validate OTP expiry | High | Error: "OTP has expired." |

##### **Edge Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC14 | Resend OTP functionality | Medium | New OTP is sent, and previously sent OTP is invalidated. |
| TC15 | Attempt to use the same OTP multiple times | High | Error: "OTP already used." |

#### **Test Suite 3: Logout from All Other Devices**

##### **Acceptance Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC16 | Verify session termination on previously logged-in devices | High | All active sessions are terminated except for the new device. |

##### **Edge Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC17 | Verify old session behavior after successful login on new device | High | "Session Expired" message is displayed on old devices. |
| TC18 | Login simultaneously from multiple locations | High | Only one device is logged in; others are logged out automatically. |

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#### **Test Suite 4: Notifications**

##### **Acceptance Test Cases:**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC19 | Verify SMS notification for successful login | High | SMS notification is sent after successful login on the new device. |

##### **Edge Test Cases**

| **Test ID** | **Test Case Description** | **Priority** | **Expected Result** |
| --- | --- | --- | --- |
| TC20 | SMS delay or failure due to gateway issue | High | Error message is displayed, and retry is attempted. |

### **Test Runs**

#### **Test Run 1: Happy Path**

* Objective: Verify that a user can log in successfully with valid credentials, log out from all other devices, and receive notifications.
* Test Cases: TC01, TC11, TC19.

#### **Test Run 2: Input Validation**

* Objective: Test the robustness of input validation for phone number, password, and OTP.
* Test Cases: TC02, TC03, TC05, TC07, TC12, TC14.

#### **Test Run 3: Edge Case Testing**

* Objective: Test uncommon or edge scenarios, such as SMS gateway failures, session timeouts, and multiple failed login attempts.
* Test Cases: TC08, TC09, TC10, TC14, TC20.

#### **Test Run 4: Security Testing**

* Objective: Verify session termination and security measures to ensure account access from only one device.
* Test Cases: TC16, TC17, TC18.