# Test Plan

## Test Scope

Test Plan will cover the functionally risk based testing of the following user stories;

* Registered User Login from a New Device
* Individual Investor – Upgrade to Premium
* Approval Notification | SMS
* Departments Approval
* Corporate Investor – Commercial Registration Verification Via [X]

## Test Approach

Utilize combination of;

* Risk based assessment
* Functional Testing
* Regression Testing
* Negative Testing
* Acceptance Testing

While initially tested manually, ideally all test cases would be full automated as part of a regression test suite.

## Test Environment

* Hardware
  + 1 PC per Test Engineer/Developer with their preferred OS installed, min. 8gb ram, 512gb hard drive
  + Ideally 1 each of top 3 most common used devices by clients or highest paying clients
    - Emulation is good but will not always catch bugs that occur when ran on actual device
* Software
  + Smart phone emulation (apple, android | latest release + 2 versions back or whichever versions are most used by current/target clients)
  + Software/Website under test
* Miscellaneous
  + Access to [X] system for testing commercial registration verification.
  + Repository Access
  + Access to any internal wiki like notion for updating internal documentation / test automation documentation

## Test Schedule

Estimated Timeline of Test activities

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Task Name** | **Description** | **Estimated Hours** | **Estimated Duration in Days (1person)** | **Estimated Duration in Days (3people)** |
| Test Plan Buy In/Approval | Coordinate between stakeholders and associated development manager to ensure smooth testing and availability of developer(s) for bug fixes without impacting new release deadlines/timelines. | 20 | 3 | 3\* |
|  |  |  |  |  |
| **Manual Test Execution** |  |  |  |  |
|  | Manual Execution of all high risk test and acceptance test cases across all user stories | 40 | 5 | 2 |
|  | Manual Execution of all medium and low risk test cases across all user stories | 80 | 10 | 4 |
|  |  |  |  |  |
| **Automation Script Development** | Including Test Framework Setup | 20 | 3 | 1 |
|  | Focus on core, acceptance, and critical path test automation. | 80 | 10 | 4 |
|  | Develop automated tests for medium and low risk scenarios. | 120 | 15 | 5 |
|  |  |  |  |  |
| **Automation Test Execution & Regression Testing** |  |  |  |  |
|  | QA Engineers run regression tests, filing detailed bug reports as needed. Associated developer helps to fix bugs discovered based on risk priority. | 40 | 5 | 2 |
|  | Comprehensive regression testing, retesting all bug fixes, manual exploratory spot checking. | 40 | 5 | 2 |
|  |  |  |  |  |
| **Acceptance Testing & Documentation** |  |  |  |  |
|  | Acceptance testing conducted with stakeholders | 40 | 5 | 5\* |
|  | Final documentation including test reports and test automation. | 20 | 3 | 1 |
|  |  |  |  |  |
| **Subtotal estimate** |  | 500hrs | 64days for 1 person | 29days for 3 ppl |
|  |  |  |  |  |
| **Something(s) Unexpected Happened** | Buffer for the unforeseen via increasing subtotal estimate by a factor of 1.333 | 167hrs | 22days | 10days |
|  |  |  |  |  |
| **Total estimate** |  | 667hrs | 86days for 1 person | 39 for 3 ppl |

Notes for estimates:

* The time required for 3 people vs 1 is not directly proportional for a reason, similar to adage 9 women cannot give birth to a single child in 1 month.
* The estimate is done on the premise of under promising the timeline in expectations it will more readily allow team to over deliver and impress clients/customers.
* \* 3 person estimate is same as single person estimate under presumption only one person will be assigned to/capable to do the task.

## Resources

Test Lead: [Test\_Lead\_A]

Test Engineers: [Test\_Engineer\_A], [Test\_Engineer\_B], [Test\_Engineer\_C]

Development Team: [Developer\_A], [Developer\_B], [Developer\_C] \* realistically only anticipating partial access to 1 developer at a time for bug fixes

# Risk Based Testing

## User Story: Registered User Login from a New Device

**High Risk**

* Login failure from a new device

Impact: potential user lockout, inability to access account

Mitigation: Test multiple different scenarios including device type, browsers.

* Failure to log out from devices

Impact: potential security breach, unauthorized access

Mitigation: Test multiple synchronous login attempts from different devices ensuring to verify that the logout of other devices consistently occurs in a timely manner.

* Failure to send or receive SMS notification

Impact: Reduced account security

Mitigation: Test with multiple carriers and differing network conditions

**Medium Risk**

* Failure to validation phone number and or password

Impact: potential security vulnerability

Mitigation: Test multiple inputs with emphasis on edge and negative cases.

* Failure to generate/verify OTP

Impact: user lockout

Mitigation: Test OTP in multiple attempts, timeout scenarios, delivery issues.

**Low Risk**

* Failure to send/display successful login message

Impact: potential minor usability issue

Mitigation: Ensure regression testing of multiple devices includes check for successful login message upon successfully logging in.

* Failure to redirect to home page after successful login

Impact: potential minor usability issue

Mitigation: Ensure regression testing of multiple devices includes check for redirection to home page upon successfully logging in.

## User Story: Individual Investor – Upgrade to Premium

**High Risk**

* Document upload and or validation failure(s)

Impact: potential customer loss due to inability to upgrade, potential data loss

Mitigation: Test various file types, sizes, both valid and invalid formats. Ensure error messages are both meaningful and appropriate.

* Compliance Approval Workflow (issues in approval process

Impact: delayed upgrade, upsetting / potentially losing customer

Mitigation: Ensure regression testing cover core and negative scenarios, including notification to user, compliance department, and relations manager.

**Medium Risk**

* Incorrect implementation of eligibility criteria/criteria checks

Impact: incorrect upgrade approval

Mitigation: Test all combinations of eligibility options as well as edge/negative scenarios.

**Low Risk**

* Missing notification on successful upload

Impact: potential minor usability issue

Mitigation: Ensure regression testing of multiple devices includes checks notification message on successful upload.

## User Story: Approval Notifications | SMS

**High Risk**

* Failure to deliver approval/rejection notifications via SMS  
  Impact: Lack of information to the user, potential missed deadlines  
  Mitigation: Test with different carriers and network conditions. Thoroughly test both approval and rejection scenarios to ensure proper SMS delivery.
* Incorrect or missing reasons for rejection in SMS  
  Impact: Upsetting User, potentially losing customer, & inability to rectify issues  
  Mitigation: Verify the reliability, consistently, and clarity of the rejection messages in the SMS to ensure users receive helpful feedback.

**Medium Risk**

* Failure to notify the relationship manager on rejections

Impact: Delayed resolution of issues, upsetting customer(s)

Mitigation: Test notification delivery and content to ensure the relationship manager is notified promptly upon rejection.

**Low Risk**

## User Story: Departments Approval

**High Risk**

* Approval Workflow  
  Impact: Incorrect loan approvals, inconsistencies  
  Mitigation: Test various scenarios including approvals and rejections from multiple departments to ensure the approval process functions correctly.
* **Approval Tracking**Impact: Auditability issues, potential disputes  
  Mitigation: Verify the accuracy and completeness of approval tracking information, including timestamps, to ensure it is correctly recorded.

**Medium Risk**

* "Approve" Button Functionality:

Impact: Inability to approve requests, upset customer(s)

Mitigation: Test button functionality under various conditions to ensure it operates as expected.

**Low Risk**

## User Story: Corporate Investor – Commercial Registration Verification Via [X]

**High Risk**

* Third-Party Integration

Impact: Inability to verify registrations, system unavailability, upset/loss of customer(s)

Mitigation: Test the integration thoroughly, including error handling and recovery. Simulate various suboptimal scenarios with service [X], such as slow response times and network outages.

* Data Validation

Impact: Incorrect assessment of corporate investors

Mitigation: Thoroughly test both valid and invalid commercial registration numbers, edge cases, and different data formats to ensure proper validation.

**Medium Risk**

* Start Date Validation

Impact: Incorrect rejection of investors, loss of potential customer(s)

Mitigation: Test edge cases for the two-year start date rule (e.g., exactly two years, slightly less than two years) to ensure correct implementation.

**Low Risk**

* User Notifications

Impact: Minor usability issue

Mitigation: Verify the accuracy and completeness of user notifications during the verification process to ensure they are displayed as expected.

# Test Cases

## User Story: Registered User Login from a New Device

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Input Data** | **Expected Result** | **Risk LVL** | **Test Type** |
| **Login\_NewDevice\_Success** | Successful login from a new device. | Valid phone number, valid password, valid OTP | Successful login, SMS notification received, logout from other devices, redirection to homepage. | High | Acceptance |
| **Login\_NewDevice\_InvalidPhone** | Login with invalid phone number | Invalid phone number, valid password | Error message indicating invalid phone number. | High | Edge |
| **Login\_NewDevice\_InvalidPassword** | Login with invalid password | Valid phone number, invalid password | Error message indicating incorrect password. | High | Edge |
| **Login\_NewDevice\_OTP\_Failure** | Login with valid credentials but OTP failure (simulated) | Valid phone number, valid password, invalid OTP | Error message indicating invalid OTP, retry option. | High | Edge |
| **Login\_NewDevice\_NoSMS** | Login attempt, SMS not received (simulated) | Valid phone number, valid password, valid OTP | Successful login but no SMS notification received (note: system behavior may vary). Log this as a potential issue. | High | Edge |
| **Login\_NewDevice\_MultipleDevices** | Concurrent login attempts from multiple devices. | Valid credentials from multiple devices concurrently | Only one device should remain logged in. Other sessions should be terminated. | High | Edge |
| **Login\_NewDevice\_DifferentBrowsers** | Login from various browsers (Chrome, Firefox, Safari). | Valid credentials | Successful login in all browsers. Only one device should remain logged in at all times. | Medium | Acceptance |
| **Login\_NewDevice\_EdgeCases\_Phone** | Login with edge case phone numbers (e.g., very long number, special characters). | Edge case phone numbers, valid password | Appropriate error handling (e.g., validation error message). | Medium | Edge |
| **Login\_NewDevice\_EdgeCases\_Password** | Login with edge case passwords (e.g., very long password, special characters, minimum length). | Valid phone number, edge case passwords | Appropriate error handling (e.g., validation error message). | Medium | Edge |
| **Login\_NewDevice\_SuccessMessage** | Verify successful login message content and display. | Valid credentials | Correct and clear success message displayed. | Low | Acceptance |
| **Login\_NewDevice\_HomepageRedirect** | Verify successful redirection to homepage. | Valid credentials | Redirection to the correct homepage. | Low | Acceptance |

## User Story: Individual Investor – Upgrade to Premium

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Input Data** | **Expected Result** | **Risk LVL** | **Test Type** |
| **Upgrade\_Success** | Successful premium upgrade with valid documents. | One of the eligibility criteria met, valid supporting documents. | Successful upgrade, notification to user, compliance, and relationship manager. | High | Acceptance |
| **Upgrade\_InvalidDocuments** | Attempt upgrade with invalid document types. | One eligibility criteria met, invalid documents (wrong format, corrupted files). | Error message indicating invalid document type(s). | High | Edge |
| **Upgrade\_MissingDocuments** | Attempt upgrade with missing documents. | One eligibility criteria met, but missing documents. | Error message indicating missing documents. | High | Edge |
| **Upgrade\_NoEligibility** | Attempt upgrade without meeting any eligibility criteria. | No eligibility criteria met. | Rejection with explanation, notification to user. | High | Edge |
| **Upgrade\_ComplianceRejection** | Test the rejection workflow from compliance. | Valid documents and eligibility criteria. | Rejection notification to user, RM notified. | High | Edge |
| **Upgrade\_LargeFileSize** | Upload very large document files (beyond allowed limit). | Valid documents exceeding the allowed size. | Error message indicating file size exceeded. | Medium | Edge |
| **Upgrade\_MultipleEligibility** | Test all combinations of eligibility criteria. | Combinations of meeting one or more eligibility criteria. | Correct upgrade approval or rejection based on the criteria met. | Medium | Acceptance/Edge |
| **Upgrade\_NotificationSuccess** | Verify notification message on successful document upload. | Valid document upload | Notification confirming successful upload. | Low | Acceptance |

## User Story: Approval Notifications | SMS

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Input Data** | **Expected Result** | **Risk LVL** | **Test Type** |
| **Approval\_SMS** | Test SMS notification for loan approval. | Simulate loan approval by all departments and RM. | SMS notification to loan requester with approval status. | High | Acceptance |
| **Rejection\_SMS\_RM** | Test SMS notification for loan rejection by RM. | Simulate loan rejection by RM with specified reasons. | SMS notification to loan requester with rejection reasons from the RM. | High | Edge |
| **Rejection\_SMS\_Department** | Test notification to RM for departmental rejection | Simulate rejection by a department. | Notification to RM with rejection reasons, no notification to requester at this stage. | High | Edge |
| **NoSMS\_Approval** | Simulate failure to send SMS for approval. | Simulate loan approval, but block SMS delivery. | No SMS received, system logs the failure. | Medium | Edge |
| **NoSMS\_Rejection** | Simulate failure to send SMS for rejection. | Simulate loan rejection by RM, but block SMS delivery. | No SMS received, system logs the failure. | Medium | Edge |

## User Story: Departments Approval

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Input Data** | **Expected Result** | **Risk LVL** | **Test Type** |
| **Approve\_Request** | Approve a loan request. | Loan request in review. | Request marked as approved, timestamp recorded. | High | Acceptance |
| **Reject\_Request** | Reject a loan request. | Loan request in review. | Request marked as rejected, timestamp recorded, appropriate rejection notes. | High | Edge |
| **MultipleApprovals** | Multiple departments approve a request. | Loan request requiring multiple departmental approvals. | All approvals recorded with timestamps and approvers. | High | Acceptance |
| **ApprovalHistory** | Verify approval history visibility. | Loan request with multiple approvals. | History section displays all approvals with details. | Medium | Acceptance |
| **MissingApproveButton** | Test scenario where "Approve" button is missing. | Loan request in review in a specific department with missing button due to incorrect permissions/configuration. | Error or warning message. | High | Edge |

## User Story: Corporate Investor – Commercial Registration Verification Via [X]

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test Case ID** | **Description** | **Input Data** | **Expected Result** | **Risk LVL** | **Test Type** |
| **ValidRegistration** | Successful verification with valid registration number. | Valid registration number. | Successful verification, proceed to next step. | High | Acceptance |
| **InvalidRegistration** | Verification with invalid registration number. | Invalid registration number. | Error message, prompt to re-enter registration number. | High | Edge |
| **Registration\_ThirdPartyFailure** | Simulate failure of [X] service. | Valid registration number, but [X] simulates failure. | Error message indicating service unavailable. Retry mechanism should be present. | High | Edge |
| **StartDate\_Valid** | Verification with start date > 2 years. | Valid registration number, start date > 2 years. | Successful verification, proceed to next step. | Medium | Acceptance |
| **StartDate\_Invalid** | Verification with start date < 2 years. | Valid registration number, start date < 2 years. | Notification to the user that they cannot proceed, clear explanation. | Medium | Edge |
| **StartDate\_EdgeCase** | Verification with start date exactly 2 years ago. | Valid registration number, start date exactly 2 years ago. | System behavior should be clearly defined (either accept or reject, but consistent). | Medium | Edge |

# Test Runs

Since software under test is unavailable and this is presumed to be a theoretical exercise; test runs would have each of the above test cases would be executed across different environments and scenarios. The test runs should include:

1. **Execution of Acceptance Test Cases** - Ensure the basic functionality works as per the user story requirements.
2. **Execution of Edge Test Cases** - Ensure that the system can handle unexpected or unusual inputs.
3. **Prioritize of High Risk Test Cases**
4. **Automated Regression Tests** – Will be organized by User Story first then risk level

Each test run will be executed, and results will be logged to verify pass/fail statuses. Each [automated] run will include a unique ID, execution date, tester, and results summary.