

## 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

<b>Task Name</b>	<b>Description</b>	<b>Estimated Hours</b>	<b>Estimated Duration in Days (1person)</b>	<b>Estimated Duration in Days (3people)</b>
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*
<b>Manual Test Execution</b>				
	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
<b>Automation Script Development</b>	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
<b>Automation Test Execution &amp; Regression Testing</b>				
	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

<b>Acceptance Testing &amp; Documentation</b>				
	Acceptance testing conducted with stakeholders	40	5	5*
	Final documentation including test reports and test automation.	20	3	1
<b>Subtotal estimate</b>		500hrs	64days for 1 person	29days for 3 ppl
<b>Something(s) Unexpected Happened</b>	Buffer for the unforeseen via increasing subtotal estimate by a factor of 1.333	167hrs	22days	10days
<b>Total estimate</b>		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, consistency, 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
<b>Login_New Device_Success</b>	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
<b>Login_New Device_InvalidPhone</b>	Login with invalid phone number	Invalid phone number, valid password	Error message indicating invalid phone number.	High	Edge
<b>Login_New Device_InvalidPassword</b>	Login with invalid password	Valid phone number, invalid password	Error message indicating incorrect password.	High	Edge
<b>Login_New Device_OTP_Failure</b>	Login with valid credentials but OTP failure (simulated)	Valid phone number, valid password, invalid OTP	Error message indicating invalid OTP, retry option.	High	Edge
<b>Login_New Device_NoSMS</b>	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
<b>Login_New Device_MultipleDevices</b>	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
<b>Login_New Device_DifferentBrowsers</b>	Login from various browsers (Chrome, Firefox, Safari).	Valid credentials	Successful login in all browsers.	Medium	Acceptance

<b>rentBrowser s</b>			Only one device should remain logged in at all times.		
<b>Login_New Device_EdgeCases_Phone</b>	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
<b>Login_New Device_EdgeCases_Password</b>	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
<b>Login_New Device_SuccessMessage</b>	Verify successful login message content and display.	Valid credentials	Correct and clear success message displayed.	Low	Acceptance
<b>Login_New Device_HomepageRedirect</b>	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
<b>Upgrade_Success</b>	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
<b>Upgrade_Invalid Documents</b>	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
<b>Upgrade_Missing Documents</b>	Attempt upgrade with missing documents.	One eligibility criteria met, but missing documents.	Error message indicating missing documents.	High	Edge
<b>Upgrade_NoEligibility</b>	Attempt upgrade without meeting any eligibility criteria.	No eligibility criteria met.	Rejection with explanation, notification to user.	High	Edge
<b>Upgrade_ComplianceRejection</b>	Test the rejection workflow from compliance.	Valid documents and eligibility criteria.	Rejection notification to user, RM notified.	High	Edge
<b>Upgrade_Large FileSize</b>	Upload very large document files (beyond allowed limit).	Valid documents exceeding the allowed size.	Error message indicating file size exceeded.	Medium	Edge
<b>Upgrade_MultipleEligibility</b>	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
<b>Upgrade_NotificationSuccess</b>	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
<b>Approval_SMS</b>	Test SMS notification for loan approval.	Simulate loan approval by all departments and RM.	SMS notification to loan requester with approval status.	High	Acceptance
<b>Rejection_SMS_RM</b>	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
<b>Rejection_SMS_Department</b>	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
<b>NoSMS_Approval</b>	Simulate failure to send SMS for approval.	Simulate loan approval, but block SMS delivery.	No SMS received, system logs the failure.	Medium	Edge
<b>NoSMS_Rejection</b>	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
<b>Approve_Request</b>	Approve a loan request.	Loan request in review.	Request marked as approved, timestamp recorded.	High	Acceptance
<b>Reject_Request</b>	Reject a loan request.	Loan request in review.	Request marked as rejected, timestamp recorded, appropriate rejection notes.	High	Edge
<b>MultipleApprovals</b>	Multiple departments approve a request.	Loan request requiring multiple departmental approvals.	All approvals recorded with timestamps and approvers.	High	Acceptance
<b>ApprovalHistory</b>	Verify approval history visibility.	Loan request with multiple approvals.	History section displays all approvals with details.	Medium	Acceptance
<b>MissingApproveButton</b>	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
<b>ValidRegistration</b>	Successful verification with valid registration number.	Valid registration number.	Successful verification, proceed to next step.	High	Acceptance
<b>InvalidRegistration</b>	Verification with invalid registration number.	Invalid registration number.	Error message, prompt to re-enter registration number.	High	Edge
<b>Registration_ThirdPartyFailure</b>	Simulate failure of [X] service.	Valid registration number, but [X] simulates failure.	Error message indicating service unavailable. Retry mechanism should be present.	High	Edge
<b>StartDate_Valid</b>	Verification with start date > 2 years.	Valid registration number, start date > 2 years.	Successful verification, proceed to next step.	Medium	Acceptance
<b>StartDate_Invalid</b>	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
<b>StartDate_EdgeCase</b>	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.