

Traceability Matrix

ParaBank Demo Application

Document Information

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Document Changes

Version	Date	Author	Changes
1.0	2025-08-30	Test Analyst	Initial traceability for 200 test cases

1. What is Traceability Matrix?

1.1 Purpose

This document shows the connection between **ParaBank requirements** and **our 200 test cases**. It helps us make sure we test everything important and don't miss anything.

1.2 Why We Need It

- **Check coverage** - make sure all requirements are tested
- **Find gaps** - see what we might have missed
- **Track progress** - know which requirements are tested
- **Show compliance** - prove we tested what was asked
- **Impact analysis** - understand effect of requirement changes

1.3 How to Read This Matrix

- **Requirement** = what the app should do
 - **Test Cases** = tests that check the requirement
 - **Coverage %** = how well we test each requirement
 - **Status** = if testing is done, in progress, or not started
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2. Requirements Coverage Summary

2.1 Overall Coverage Statistics

Category	Total Requirements	Test Cases	Coverage %	Status
Authentication	8 requirements	35 test cases	100%	Complete
Registration	6 requirements	25 test cases	100%	Complete
Account Management	7 requirements	40 test cases	100%	Complete
Transactions	8 requirements	55 test cases	100%	Complete
Reports & Search	5 requirements	20 test cases	100%	Complete
Security	6 requirements	15 test cases	90%	In Progress
Performance	4 requirements	10 test cases	85%	In Progress
Usability	4 requirements	10 test cases	80%	In Progress

TOTAL: 48 requirements → 200 test cases → 96% coverage

3. Detailed Requirements to Test Cases Mapping

3.1 Authentication Module

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_AUTH_001	Users can login with valid username and password	TC_001, TC_002, TC_003	100%	Critical
REQ_AUTH_002	Show error message for wrong login details	TC_004, TC_005, TC_006, TC_007	100%	High
REQ_AUTH_003	Prevent brute force password attacks	TC_008, TC_009, TC_010	100%	Critical
REQ_AUTH_004	Logout users after 30 minutes of no activity	TC_011, TC_012	100%	Medium
REQ_AUTH_005	Logout button ends user session properly	TC_013, TC_014, TC_015	100%	High

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_AUTH_006	Stop SQL injection attacks in login form	TC_016, TC_017, TC_018	100%	Critical
REQ_AUTH_007	Protect against XSS attacks in login	TC_019, TC_020	100%	Critical
REQ_AUTH_008	Login form works in different browsers	TC_021, TC_022, TC_023, TC_024	100%	High

Authentication Total: 8 requirements → 35 test cases

3.2 Registration Module

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_REG_001	New users can register with personal information	TC_036, TC_037, TC_038	100%	Critical
REQ_REG_002	All required fields must be filled correctly	TC_039, TC_040, TC_041, TC_042, TC_043	100%	High
REQ_REG_003	Username must be unique in the system	TC_044, TC_045	100%	High
REQ_REG_004	Password must be strong enough	TC_046, TC_047, TC_048	100%	Medium
REQ_REG_005	Phone number format must be valid	TC_049, TC_050, TC_051	100%	Low
REQ_REG_006	Social Security Number format must be correct	TC_052, TC_053, TC_054	100%	Medium

Registration Total: 6 requirements → 25 test cases

3.3 Account Management Module

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_ACC_001	Users can see all their accounts overview	TC_061, TC_062, TC_063, TC_064, TC_065	100%	Critical
REQ_ACC_002	Account balances show correct amounts	TC_066, TC_067, TC_068, TC_069	100%	Critical
REQ_ACC_003	Users can open new checking accounts	TC_076, TC_077, TC_078, TC_079	100%	Critical
REQ_ACC_004	Users can open new savings accounts	TC_080, TC_081, TC_082, TC_083	100%	Critical

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_ACC_005	Starting money moves from existing account	TC_084, TC_085, TC_086	100%	High
REQ_ACC_006	Each account gets unique account number	TC_087, TC_088	100%	High
REQ_ACC_007	Users can view detailed account information	TC_091, TC_092, TC_093, TC_094, TC_095	100%	High

Account Management Total: 7 requirements → 40 test cases

3.4 Transaction Processing Module

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_TXN_001	Users can transfer money between their accounts	TC_101, TC_102, TC_103, TC_104, TC_105	100%	Critical
REQ_TXN_002	Cannot transfer more money than available	TC_106, TC_107, TC_108	100%	Critical
REQ_TXN_003	Users can pay bills to registered payees	TC_126, TC_127, TC_128, TC_129	100%	High
REQ_TXN_004	Users can add new people to pay bills to	TC_130, TC_131, TC_132, TC_133	100%	High
REQ_TXN_005	Users can request different types of loans	TC_146, TC_147, TC_148, TC_149	100%	Medium
REQ_TXN_006	All money movements are saved with date/time	TC_115, TC_139, TC_145	100%	High
REQ_TXN_007	Transfer confirmation before processing	TC_116, TC_117	100%	High
REQ_TXN_008	Bill payment confirmation and tracking	TC_134, TC_135, TC_136	100%	High

Transactions Total: 8 requirements → 55 test cases

3.5 Reports and Search Module

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_RPT_001	Users can search for transactions by	TC_156, TC_157, TC_158,	100%	Medium

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
	different ways	TC_159, TC_160		
REQ_RPT_002	Users can see their account activity history	TC_096, TC_097, TC_161, TC_162	100%	High
REQ_RPT_003	Users can create monthly account statements	TC_171, TC_172, TC_173	100%	Medium
REQ_RPT_004	Search works with date ranges	TC_163, TC_164, TC_165	100%	Low
REQ_RPT_005	Users can export and download reports	TC_174, TC_175	100%	Low

Reports Total: 5 requirements → 20 test cases

4. Non-Functional Requirements Coverage

4.1 Security Requirements

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_SEC_001	Prevent harmful code injection in all forms	TC_016, TC_017, TC_018, TC_052, TC_053	90%	Critical
REQ_SEC_002	Keep user sessions safe and secure	TC_011, TC_012, TC_013, TC_014	85%	Critical
REQ_SEC_003	Protect data when sending over internet	TC_025, TC_026	70%	High
REQ_SEC_004	Check user permissions are working	TC_027, TC_028, TC_029	80%	High
REQ_SEC_005	Stop unauthorized access to user accounts	TC_030, TC_031, TC_032	90%	Critical
REQ_SEC_006	Log all security-related events	TC_033, TC_034, TC_035	95%	High

Security Total: 6 requirements → 15 test cases → 87% coverage

4.2 Performance Requirements

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_PERF_001	Pages load in less than 3 seconds	TC_191, TC_192	80%	High
REQ_PERF_002	Money transfers complete in under 2 seconds	TC_193, TC_194	90%	High
REQ_PERF_003	App works with 100 users at same time	TC_195, TC_196	85%	Medium

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_PERF_004	No memory leaks during long sessions	TC_197, TC_198	80%	Medium

Performance Total: 4 requirements → 10 test cases → 84% coverage

4.3 Usability Requirements

Requirement ID	Requirement Description	Test Cases	Coverage	Priority
REQ_UI_001	Works properly in Chrome, Firefox, Safari	TC_021, TC_022, TC_023	100%	High
REQ_UI_002	Mobile phones and tablets can use the app	TC_024, TC_199	80%	Medium
REQ_UI_003	Easy for people with disabilities to use	TC_200	70%	Medium
REQ_UI_004	Error messages are clear and helpful	TC_004, TC_005, TC_039, TC_040	90%	Medium

Usability Total: 4 requirements → 10 test cases → 85% coverage

5. Coverage Analysis

5.1 Requirements Coverage by Priority

5.1.1 Critical Requirements (Must Test 100%)

Category	Requirements	Test Cases	Coverage	Status
Login Security	4 requirements	18 test cases	100%	<input checked="" type="checkbox"/> Fully covered
Money Operations	3 requirements	25 test cases	100%	<input checked="" type="checkbox"/> Fully covered
Account Access	3 requirements	15 test cases	100%	<input checked="" type="checkbox"/> Fully covered
Data Protection	2 requirements	8 test cases	100%	<input checked="" type="checkbox"/> Fully covered

Critical Total: 12 requirements → 66 test cases → 100% coverage

5.1.2 High Priority Requirements (Should Test 90%+)

Category	Requirements	Test Cases	Coverage	Status
Registration	4 requirements	20 test cases	95%	✓ Well covered
Account Management	4 requirements	25 test cases	100%	✓ Fully covered
Transaction Processing	5 requirements	30 test cases	90%	✓ Well covered
Reporting	3 requirements	15 test cases	85%	💡 Good coverage

High Priority Total: 16 requirements → 90 test cases → 93% coverage

5.1.3 Medium/Low Priority (Should Test 70%+)

Category	Requirements	Test Cases	Coverage	Status
Advanced Features	8 requirements	25 test cases	80%	✓ Good coverage
Performance	4 requirements	10 test cases	75%	💡 Acceptable
Browser Support	4 requirements	8 test cases	70%	💡 Acceptable
Mobile Support	4 requirements	1 test case	60%	⚠️ Needs more tests

Medium/Low Total: 20 requirements → 44 test cases → 71% coverage

6. Detailed Requirements to Test Cases Mapping

6.1 Authentication Requirements

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_AUTH_001	Valid login works	TC_001, TC_002, TC_003	Successful login variations	100%
REQ_AUTH_002	Invalid login shows error	TC_004, TC_005, TC_006, TC_007	Wrong credentials scenarios	100%
REQ_AUTH_003	Brute force protection	TC_008, TC_009, TC_010	Multiple failed attempts	100%
REQ_AUTH_004	Session timeout	TC_011, TC_012	Inactive user logout	100%
REQ_AUTH_005	Logout functionality	TC_013, TC_014, TC_015	Proper session termination	100%
REQ_AUTH_006	SQL injection prevention	TC_016, TC_017, TC_018	Malicious code in login	100%
REQ_AUTH_007	XSS attack prevention	TC_019, TC_020	Script injection attempts	100%
REQ_AUTH_008	Browser compatibility	TC_021, TC_022, TC_023, TC_024	Login in different browsers	100%

6.2 Registration Requirements

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_REG_001	User registration works	TC_036, TC_037, TC_038	Successful registration	100%
REQ_REG_002	Required field validation	TC_039, TC_040, TC_041, TC_042, TC_043	Empty and invalid fields	100%
REQ_REG_003	Username uniqueness	TC_044, TC_045	Duplicate username handling	100%
REQ_REG_004	Password complexity	TC_046, TC_047, TC_048	Weak password rejection	100%
REQ_REG_005	Phone format validation	TC_049, TC_050, TC_051	Phone number formats	100%
REQ_REG_006	SSN format validation	TC_052, TC_053, TC_054	Social security formats	100%

6.3 Account Management Requirements

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_ACC_001	Account overview display	TC_061, TC_062, TC_063, TC_064, TC_065	Show all accounts	100%
REQ_ACC_002	Correct balance display	TC_066, TC_067, TC_068, TC_069	Balance accuracy	100%
REQ_ACC_003	Open checking account	TC_076, TC_077, TC_078, TC_079	Checking account creation	100%
REQ_ACC_004	Open savings account	TC_080, TC_081, TC_082, TC_083	Savings account creation	100%
REQ_ACC_005	Initial deposit transfer	TC_084, TC_085, TC_086	Money movement validation	100%
REQ_ACC_006	Unique account numbers	TC_087, TC_088	Account ID generation	100%
REQ_ACC_007	Account details viewing	TC_091, TC_092, TC_093, TC_094, TC_095	Account information display	100%

6.4 Transaction Requirements

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_TXN_001	Fund transfers work	TC_101, TC_102, TC_103, TC_104, TC_105	Money transfer scenarios	100%

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_TXN_002	Overdraft prevention	TC_106, TC_107, TC_108	Insufficient funds handling	100%
REQ_TXN_003	Bill payment processing	TC_126, TC_127, TC_128, TC_129	Pay bills functionality	100%
REQ_TXN_004	Payee management	TC_130, TC_131, TC_132, TC_133	Add/edit/delete payees	100%
REQ_TXN_005	Loan request system	TC_146, TC_147, TC_148, TC_149	Loan application process	100%
REQ_TXN_006	Transaction logging	TC_115, TC_139, TC_145	Record all money movements	100%
REQ_TXN_007	Transfer confirmation	TC_116, TC_117	User confirmation process	100%
REQ_TXN_008	Payment tracking	TC_134, TC_135, TC_136	Bill payment status	100%

6.5 Search and Reports Requirements

Req ID	Requirement	Test Case IDs	Test Names	Coverage
REQ_RPT_001	Transaction search	TC_156, TC_157, TC_158, TC_159, TC_160	Find transactions	100%
REQ_RPT_002	Account activity history	TC_096, TC_097, TC_161, TC_162	View transaction history	100%
REQ_RPT_003	Monthly statements	TC_171, TC_172, TC_173	Generate reports	100%
REQ_RPT_004	Date range search	TC_163, TC_164, TC_165	Search by dates	100%
REQ_RPT_005	Export functionality	TC_174, TC_175	Download reports	100%

7. Gap Analysis

7.1 Coverage Gaps (Areas needing more tests)

7.1.1 Medium Priority Gaps

Requirement Area	Current Coverage	Target Coverage	Gap	Additional Tests Needed
Mobile responsiveness	60%	80%	20%	4 more test cases
Accessibility features	70%	90%	20%	3 more test cases
Error message consistency	75%	90%	15%	2 more test cases

7.1.2 Low Priority Gaps

Requirement Area	Current Coverage	Target Coverage	Gap	Action
Help documentation	50%	70%	20%	Add to future releases
Advanced reporting	60%	80%	20%	Consider if time allows
International support	40%	60%	20%	Future enhancement

7.2 Over-Coverage Analysis

Some areas have more tests than minimally needed:

Requirement Area	Current Tests	Minimum Needed	Extra Tests	Justification
Login security	15 tests	8 tests	7 extra	High risk area - extra coverage needed
Money transfers	25 tests	15 tests	10 extra	Critical business function
Form validation	20 tests	12 tests	8 extra	User experience important

8. Test Coverage Metrics

8.1 Requirements Coverage Summary

- **Total Requirements:** 48
- **Requirements with Tests:** 46
- **Requirements Fully Tested:** 42
- **Requirements Partially Tested:** 4
- **Requirements Not Tested:** 2

8.2 Coverage by Test Type

Test Type	Requirements Covered	Test Cases	Coverage %
Functional	34 requirements	160 test cases	92%
Security	6 requirements	15 test cases	87%
Performance	4 requirements	10 test cases	84%
Usability	4 requirements	10 test cases	85%
API	8 requirements	30 test cases	95%

8.3 Priority-Based Coverage

Priority	Requirements	Test Cases	Target Coverage	Actual Coverage
Critical	12 requirements	66 test cases	100%	<input checked="" type="checkbox"/> 100%
High	16 requirements	90 test cases	95%	<input checked="" type="checkbox"/> 93%
Medium	12 requirements	30 test cases	85%	<input checked="" type="checkbox"/> 86%
Low	8 requirements	14 test cases	70%	<input checked="" type="checkbox"/> 71%

9. Impact Analysis

9.1 If Requirements Change

This matrix helps us understand what happens if requirements change:

Example: If REQ_TXN_001 (money transfers) changes:

- **Affected Test Cases:** TC_101 through TC_125 (25 tests)
- **Impact:** High - need to update many tests
- **Time to Update:** 2-3 days
- **Priority:** Must update immediately

9.2 Uncovered Requirements

Requirements with no test cases:

- REQ_HELP_001: Online help system (Low priority)
- REQ_ADMIN_001: Admin panel access (Out of scope)

Action: Document as known gaps, consider future testing

10. Recommendations

10.1 Coverage Improvements

1. **Add 4 more mobile tests** to reach 80% mobile coverage
2. **Add 3 accessibility tests** for better compliance
3. **Consider 2 more performance tests** for load scenarios

10.2 Maintenance Plan

- **Update matrix monthly** when requirements change
 - **Review coverage quarterly** for gaps
 - **Add new test cases** when features are added
 - **Remove obsolete tests** when features removed
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Matrix Approval

Role	Name	Signature	Date
Test Analyst	Test Analyst	_____	_____
Test Lead	Sarah Johnson	_____	_____
Test Manager	Test Manager	_____	_____

This matrix will be updated whenever requirements change or new test cases are added. All changes must be reviewed and approved.