Functional Specifications — ECU

This document is intended for the Design and Dev/Infra teams as a detailed design reference. It must be updated whenever business rules change, in line with the user story canvas and the release plan.

It describes **the precise operation** of the application: the required screens, the business rules (what happens in each scenario, including edge cases), and the expected behaviors.

To be read in conjunction with: General Specifications, User Story Canvas, Release Plan

1. General Functional Architecture

The application is organized around **five central entities** that structure all its features :

1. **User**: a unique profile, with a primary currency and preferences.

2. **Account**: a means of holding funds (cash, mobile money, bank account, informal savings), linked to a specific currency.

3. **Transaction**: any movement of money (expense, income, internal transfer, adjustment), linked to an account, a category, and a date.

4. **Goal/Budget**: a budget by category, savings goal, or loan repayment schedule—these are "containers" that organize money over time.

5. **Supporting Content**: advice, articles, and contextual alerts generated based on user behavior.

All functional modules are organized around these entities. The simplified relational schema :

```
User (1) ──< has >── (N) Account Account (1)
──< records >── (N) Transaction
User (1) ──< defines >── (N) Budget / Savings Goal / Loan Transaction ──< can
trigger >── Supporting content (alert, advice)
```

2. Onboarding Module

2.1 Functional Flow

1. Welcome screen → registration option (phone + OTP, or email + password).

2. Profile questionnaire (optional, can be "skipped"): level of financial literacy (3 options : beginner / comfortable / advanced), main goal (saving / budgeting / getting out of debt / growing one's wealth).

3. Select primary currency (list + search).

4. Guided setup of the first account(s) (at least one account required to continue, with the option to set the initial balance to 0).

5. Visual tutorial (3–5 screens; can be “skipped” at any time).

6. Arrival at the main dashboard.

2.2 Management Rules

- **RG -ONB-01**: Registration fails if the phone number or email address is already in use → clear message + option to log in.
- **RG -ONB-02**: If the user skips the profile questionnaire, a default “regular user” profile is applied (intermediate customization level), which can be modified later in the settings.
- **RG -ONB-03**: Creating at least one account is **required** to complete onboarding (without an account, no transactions can be recorded).
- **RG -ONB-04**: The primary currency can be changed later, but a warning is displayed at that time explaining the impact on consolidated views (see Accounts module).

2.3 Edge Cases to Handle

- User who closes the app during onboarding → resumes exactly where they left off the next time they open it.
- User who has neither an email address nor a verifiable phone number (rare but possible) → provide an alternative account recovery method (security question or backup code).

3. Account Management Module

3.1 Required Screens

- List of accounts (with balance per account + consolidated total at the top of the screen)
- Account Details (balance, transaction history filtered by this account)
- Form for creating/editing an account
- Form for transferring funds between accounts

3.2 Management rules

- **RG-CPT-01**: An account is defined by: name (free-form), type (cash / mobile money / bank / informal savings / other), currency, initial balance, icon/color.
- **RG-CPT-02**: If type = mobile money, a “operator” subfield is available (Orange Money, MTN MoMo, Wave, Moov Money, Airtel Money, Other)—this is an informational field with no technical integration with the operator in V1.

- **RG -CPT-03**: An account's balance = initial balance + total income – total expenses – incoming transfers – outgoing transfers + adjustments. Recalculated in real time with each transaction.
- **RG -CPT-04**: An account cannot be deleted if it contains transactions—it can be **archived** (hidden from active lists, but the history remains viewable if needed, e.g., for export).
- **RG -CPT-05**: A transfer between two accounts in different currencies requires the user to enter the applied exchange rate (no automatic rate retrieval in V1); this rate is recorded on the transfer transaction for traceability.
- **RG -CPT-06**: The consolidated total (in the "My Accounts" view) converts each account not denominated in the primary currency using a reference rate that can be manually adjusted in the settings, with a visual indicator showing that this is an indicative conversion.

3.3 Edge Cases

- Negative account balance after an expense is entered (overdraft): **allowed** (the app does not block the entry, since in real-world use the balance may be temporarily negative or the user may have entered the initial balance incorrectly), but a "negative balance" visual badge appears on the account along with a notification (see Notifications module).
- Deleting an account used as the source or destination of a transfer: the transfer remains visible in the history with the label "archived account."

4. Income and Expense Tracking Module

4.1 Required Screens

- Quick Add Form (expense/income), accessible in 1–2 taps from the dashboard
- Built-in calculator (overlay on the amount field)
- Transaction history with filter bar
- Transaction details (edit/delete/duplicate)

4.2 Management Rules

- **RG-DEP-01**: Required fields for a transaction: amount, account, type (expense/income), category, date (default = today's date). Optional fields: note, receipt photo, tags.
- **RG -DEP-02**: The built-in calculator is activated via an icon in the amount field; the result of the calculation replaces the field's content upon validation ("=").
- **RG -DEP-03**: Default categories are pre-filled and tailored to the local context (e.g., Transportation/motorcycle taxi, Food, Health, Housing, Family/money transfer, Tontine, Education, Leisure, Other); the user can create custom categories and subcategories, with no limit on the number.

- **RG -DEP-04**: A recurring transaction automatically generates a new entry on the scheduled date, with **a confirmation notification** before final validation (the user can adjust the amount if necessary, e.g., variable bill).
- **RG -DEP-05**: Any transaction can be edited or deleted at any time; deleting a transaction immediately recalculates the balance of the relevant account.
- **RG -DEP-06**: History filters can be combined (account + category + period + tag), and the text search applies to the “note” field.

4.3 Edge Cases

- Deleting a category used by existing transactions: past transactions retain the category (displayed as “deleted category” or reclassified as “Other,” to be decided during design); the category simply no longer appears in the options for new entries.
- Transaction with an amount of 0: not allowed; an explicit error message is displayed.
- Transaction date in the future: allowed (useful for anticipating an expected expense or income), but visually distinguished in the history (e.g., labeled “planned”).

5. Savings Module

5.1 Required Screens

- List of savings accounts/goals (with progress bar)
- Goal details (contribution history, remaining amount, due date)
- Form for creating a goal or a general savings account
- Dedicated tontine screen (contributions, next collection round)

5.2 Management rules

- **RG-EPG-01**: A flexible savings account has neither a target amount nor a due date; it serves as a “pocket” separate from the available balance, which is manually funded or debited.
- **RG -EPG-02**: A savings goal is defined by: name, target amount, target date, and associated account/pocket. The app automatically calculates a suggested periodic contribution = (remaining amount) / (number of periods remaining until the due date).
- **RG -EPG-03**: Any contribution to a goal is a “Savings” transaction, visible in the general history and linked to the relevant goal.
- **RG -EPG-04**: The “Tontine/informal savings” account type includes specific fields: usual contribution amount, frequency, and next collection date. A separate history tracks the contributions made.
- **RG -EPG-05**: Congratulatory messages are automatically triggered when 25%, 50%, 75%, or 100% of a goal is reached; if the user is behind schedule, a non-judgmental message offers a concrete suggestion (e.g., temporarily reducing a spending category identified as reducible).

5.3 Special Cases

- Goal reached before the scheduled deadline: the app offers the option to close the goal (transfer to a general savings account or a new goal) or to continue contributing.
- Deadline passed without the goal being achieved: the goal remains active; the suggested periodic contribution is recalculated and the delay is noted, without blocking further contributions.

6. Budget Management Module

6.1 Required Screens

- Overview of budgets for the current month (progress bars by category)
- Form for defining/editing a budget by category
- Comparison of budget vs. actual (monthly and multi-month)

6.2 Management Rules

- **RG -BUD-01**: A budget is defined by category and period (monthly by default, but configurable); the amount spent is calculated in real time based on expense transactions for the relevant period and category.
- **RG -BUD-02**: The initial budget suggestion (based on a few weeks of data or user-reported information during onboarding) applies a typical 50/30/20 allocation (essentials / wants / savings), adjusted to the categories actually used by the user.
- **RG -BUD-03**: Alert thresholds at 80% and 100% of the spent budget, configurable by the user (see the Notifications module for triggering).
- **RG -BUD-04**: At the end of the period, the user can duplicate the previous month's budget with a single tap; if no action is taken, the budget is **not** automatically carried over (the user must make a conscious choice to avoid outdated budgets that no longer reflect their reality).

6.3 Edge Cases

- Category with no defined budget: Expenses in this category are recorded normally in reports, but no overspend alert is triggered.
- Budget modified during the period after an overrun has already occurred: the new amount is immediately applied to the progress bar calculation (no complex retroactive adjustments to manage).

7. Asset Management Module

7.1 Required Screens

- Net Worth Dashboard (assets, liabilities, net worth, breakdown)

- Asset/Liability Addition Form
- Net Worth Trend Chart

7.2 Management Rules

- **RG-PAT-01**: An asset is defined by: name, category (real estate, vehicle, equipment, investment, other), estimated value, currency, acquisition date, and liquid/illiquid status.
- **RG -PAT-02**: Outstanding loans (Loans module) **automatically** appear as liabilities without the need for duplicate entry; a simple manual debt (excluding formal loans) can be added directly in this module.
- **RG -PAT-03**: Net worth = sum of account balances + value of assets - sum of liabilities (outstanding loans + manually entered debts).
- **RG -PAT-04**: The value of an asset can be manually adjusted at any time (no automatic valuation in V1); each change is logged to enable a trend graph.
- **RG-PAT-05**: This module is **hidden by default** for users identified as "Novice" based on the profile questionnaire; it can be enabled manually in the settings ("Enable Advanced Asset View").

7.3 Edge Cases

- Asset denominated in a currency other than the primary currency: converted using the same indicative mechanism as for accounts (RG-CPT-06).
- Deleting an asset: Requires confirmation; the associated valuation history is retained to avoid distorting the historical trend chart.

8. Credit Management Module

8.1 Required Screens

- List of Outstanding Loans (with repayment progress)
- Loan Details (Repayment Schedule, Repayment History)
- Loan application form
- Early Repayment / New Loan Simulator

8.2 Management rules

- **RG-CRD-01**: A loan is defined by: type (bank, informal/family-based, microfinance, other), initial amount, interest rate (optional), term, start date, and monthly payment.
- **RG-CRD-02**: Upon creation, a simple projected repayment schedule is generated (fixed monthly payment
× number of months), without handling complex compound interest in V1 (simplified calculation, to be clearly documented as an “estimate” for the user).

- **RG-CRD-03**: Each repayment entered by the user is a transaction linked to the loan, which reduces the outstanding principal and affects the balance of the selected source account.
- **RG -CRD-04**: An alert is triggered before a monthly payment is due (configurable timeframe, e.g., 3 days in advance), reminding the user of the amount and the account designated for payment.
- **RG -CRD-05**: The early repayment/new loan simulator calculates an estimated monthly payment based on the amount, term, and interest rate entered by the user, and compares the available monthly budget before and after; an informational warning is displayed if the estimated debt-to-income ratio exceeds 33% of the reported income.

8.3 Special Cases

- Repayment of an amount different from the expected monthly payment (higher or lower): accepted; the outstanding principal is recalculated accordingly, and the projected repayment schedule is adjusted.
- Loan paid off before the end of the projected repayment schedule: the loan automatically changes to “Paid Off” status, is removed from the active list of liabilities (net worth), and remains viewable in the history.

9. Education & Financial Guidance Module

9.1 Required Screens

- "My Financial Coach" feed (personalized advice)
- Educational Content Library (by topic and level)
- "Can I Afford It?" feature
- Periodic Financial Assessment
- Financial health score screen

9.2 Management Rules

- **RG-EDU-01**: The personalized advice engine operates on a rules-based system (V1) : Each rule matches a behavioral pattern (e.g., “more than 30% of income spent on a single category,” “three consecutive months of overspending in the same category,” “no savings contributions in the last 30 days”) with an associated recommendation.
- **RG-EDU-02**: The frequency of contextual suggestions (triggered by events) is limited to a maximum of 1–2 per week to avoid being intrusive; content in the library remains freely accessible without restriction.
- **RG -EDU-03**: The “Can I Afford This?” feature cross-references: remaining budget in the relevant category, planned savings for the period, and upcoming loan payments within 30 days; the response is categorized into 3 levels (Yes / Be Cautious / Not Recommended) with a one-sentence explanation.
- **RG -EDU-04**: The periodic (monthly) report is automatically generated on the first day of the following month, based on data from the previous month (income, expenses, savings, debt), with 2–3 recommendations prioritized according to the advice engine’s rules.

- **RG -EDU-05**: The financial health score is calculated based on transparent, weighted criteria (e.g., consistency in saving, adherence to budgets, debt-to-income ratio); users can access the calculation details via a tooltip or a dedicated screen ("How This Score Is Calculated").

9.3 Borderline Cases

- Users with insufficient data for an advisory rule to apply (e.g., first few days of use): no "empty" advice is displayed—the general content library takes over as long as data remains insufficient.
- Educational content already viewed: remains accessible, marked as "read," but may be resuggested if relevant to the context (e.g., a new similar event).

10. Notifications/Alerts Module

10.1 Management Rules

- **RG -NOT-01**: Each type of notification (data entry reminder, budget alert, low balance alert, credit/tontine reminder, educational content) can be enabled or disabled independently in the settings.
- **RG -NOT-02**: Critical alerts (100% budget overrun, negative balance) are sent immediately (push notification); data entry reminders are sent at a time configured by the user.
- **RG -NOT-03**: The frequency of entry reminders adjusts automatically: it is reduced if the user is already entering transactions regularly (e.g., at least 1 transaction per day over the last 7 days), and remains unchanged otherwise.
- **RG -NOT-04**: All notifications sent can be viewed later in an in-app notification center (not just via push notifications), so nothing is lost if a notification is missed.

11. Reports/Analysis Module

11.1 Management Rules

- **RG -RAP-01**: Distribution and comparison charts are dynamically recalculated based on the applied filters (period, account, category)—no fixed, pre-aggregated data.
- **RG -RAP-02**: The export (CSV/PDF) includes data based on the filters active at the time of export, with a header specifying the time period and the applied filters.
- **RG-RAP-03**: Key performance indicators are calculated as follows:
  - **Savings Rate** = (total saved over the period) / (total income over the period).
  - **Debt-to-Income Ratio** = (total monthly loan payments over the period) / (total income over the period).
  - **Disposable Income** = Income - (Identified Fixed Expenses + Monthly Loan Payments).

- **RG-RAP-04**: The home dashboard displays the following by default: total consolidated balance, monthly budget progress, progress toward active savings goals, and current alerts; it is customizable (rearranging/hiding widgets) in the advanced version (V5).

12. Security Module / Account

12.1 Management Rules

- **RG-SEC-01**: A PIN or biometric authentication is required each time the app is opened after a configurable period of inactivity (default: immediately upon each app restart).
- **RG -SEC-02**: Privacy mode hides all amounts displayed on the screen (replaced by asterisks or equivalent), which can be enabled or disabled via a persistent "eye" icon; the setting is saved between sessions.
- **RG -SEC-03**: Data is automatically backed up (to the cloud) if the user consents, with the option to restore it upon reinstallation or a device change, via authentication.
- **RG -SEC-04**: Account deletion is permanent, preceded by explicit double confirmation, and results in the deletion of all associated personal data.

13. Cross-cutting Rules

- **RG -TRANS-01 (Multi-Currency)**: Any consolidated view (dashboard, net worth, reports) that aggregates amounts in different currencies displays a visual indicator showing that an indicative conversion has been applied.
- **RG -TRANS-02 (Calculator)**: The built-in calculator is available from any amount input field in the application (expenses, income, savings, budget, loans), and functions exactly the same way everywhere.
- **RG -TRANS-03 (Balance Consistency)**: Any operation that changes an account balance (transaction, transfer, adjustment, loan repayment) must recalculate and reflect that balance in real time on all relevant screens (no outdated cache).
- **RG -TRANS-04 (Historical Data)**: No data is silently deleted: any deletion requires confirmation, and related items (transactions linked to a deleted account/goal/loan) remain traceable or are explicitly managed (archived rather than physically deleted when appropriate).

14. Functional Glossary

Term	**Definition**
Account	A store of value (cash, mobile money, bank account, informal savings) with its own balance and currency

Term	Definition
Transaction	Any recorded movement of money: expenditure, income, internal transfer, adjustment
Savings Account / Savings Goal	Amount set aside, with or without a defined goal and deadline
Budget	Spending limit set by category over a given period
Net worth	Total assets and accounts minus total liabilities (debts, outstanding loans)
Disposable income	Amount available after deducting fixed expenses and monthly loan payments
North Star Metric	Key metric summarizing the value delivered by the product (see general specifications)