



# BUDGETING APP

CS251 - Introduction to Software Engineering

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# LCNC analysis

Aspect	Glade	zapier
Primary Use Case	Building desktop application user interfaces.	Automating workflows between web-based apps.
Target Audience	Developers familiar with GTK and backend programming, and know about AI and LLM	Non-technical user and businesses.
Learning Curve	Moderate; requires understanding of GTK.	Minimal; intuitive interface for beginners.
Integration	Limited to GTK-based applications.	Over 5,000 integrated apps across domains.

# INTRODUCTION

This Personal Budgeting Software helps users manage: income, expenses, and savings with automated budgeting and real-time tracking.

Tailored for Egypt, it fills the gap of poor reporting, lack of AI insights, and limited multi-currency support, with offline functionality.

Key features include predictive expense analysis, goal setting, and secure financial management, empowering individuals, freelancers, and families to make smarter financial decisions and improve savings effortlessly.

# MINT

## OVERVIEW

1. Founded by Aaron Patzer.
2. A personal finance management app for the US and Canada

## GLOBAL PRACTICES

### Features

1. Budgeting: Automates budget categories.
2. Investment Tracking: Monitors market and real estate investments.
3. Security: Multi-factor authentication & Touch ID.
4. Bill Reminders: Alerts for upcoming payments.
5. Savings Goal: Helps set financial targets (e.g., buying a car).
6. Data Visualization: Uses graphs for financial insights.

### User Experience

1. Requires manual transaction recategorization.
2. No option to change the month start date.
3. Desktop version is more useful.
4. Free to use but includes ads.

# MONEYFELLOWS

## OVERVIEW

1. Egypt's first and largest Money Circles app.
2. Legally supervised by Banque Misr & Central Bank of Egypt

# EGYPT'S MARKET

## Features

1. Unlimited Payouts: Up to 1.2 M EGP; multiple circles allowed.
2. Cashback: Up to 20% cashback on payouts.
3. Payment Methods: Supports cards, bank transfers, e-wallets, and Fawry.
4. Manage your budget

## User Experience

1. Supportive Customer service
2. New update introduced unclear fees.
3. Some users find certain features difficult to understand.

# MARKET SEGMENTATION

## 1. Age Groups

- 18-24: Tech-savvy; needs help with student debt, part-time income, and university expenses.
- 25-40 (Millennials): Focused on financial goals (home savings, loans, family planning); prefers automated tools and integrations.
- 47-51: Less tech-savvy; prioritizes retirement savings; may prefer traditional methods.

# MARKET SEGMENTATION

Geographic & Economic Segmentation

Stable Economies	<p>Focus on long-term goals (retirement, investments). Demand innovative features to compete in tech-savvy markets.</p>
Unstable Economies	<p>Prioritize day-to-day survival budgeting. Need offline functionality, SMS alerts, and minimal data usage.</p>
High Inflation/Instability Regions	<p>Real-time expense tracking for rapid price changes. Multi-currency support for currency devaluation.</p>

# MARKET SEGMENTATION

## Psychographic & Behavioral Segmentation

### Psychographic Segmentation

- Financially Disciplined: Detailed analytics, customizable categories, exportable reports.
- Financially Struggling: Alerts for overspending, bill reminders, debt payoff strategies.
- Privacy-Conscious: Offline-first apps, end-to-end encryption.
- Gamification Seekers: Motivated by progress bars, badges, rewards.

### Behavioral Segmentation

Frequency of Budgeting: Daily trackers vs. monthly planners.

Tech Savviness: Power users (spreadsheet enthusiasts) vs. novices (guided tutorials).

Willingness to Pay: Free users (ad-supported) vs. premium subscribers (ad-free + advanced tools).

# MARKET SEGMENTATION

## income levels

Low income	Needs expense tracking to avoid financial shortfalls.
Middle/high level income	Manages multiple responsibilities (taxes, payments) values time-saving tools.
Freelancers	Requires tools for irregular income and tax management
High net individuals	Least likely to use; relies on lawyersassistants for wealth management.

# DOMAIN ANALYSIS

## Glossary of Key Terms:

**Gross Income:** Total earnings before deductions.

**Deductions:** Taxes, insurance, and other mandatory subtractions.

**Net Income (Take-home Pay):** Amount left after deductions.

## Expense Categories:

**Fixed Expenses:** Consistent monthly costs (rent, loans, subscriptions).

**Variable Expenses:** Changing costs (entertainment, Life Expenses and Transportation).

## Savings & Emergency Funds:

**Emergency Fund:** Backup savings for unexpected situations.

**Retirement Savings:** Long-term financial planning.

**Short-Term Savings:** Funds for planned expenses (vacations, purchases).

# Domain Analysis

## Budgeting Workflow & Tracking

### Monthly Financial Cycle:

Income is deposited.

Fixed expenses are paid first.

Variable expenses are tracked.

Remaining funds go to savings, investments, or debt repayment.

### Expense & Income Tracking:

Categorized expense logging:  
Life Expenses, Transport, etc...

Combine expenses from receipts, bank data, and manual entries.

Automatic income aggregation from multiple sources.

### Budget Analysis & Reporting:

Compare actual vs. planned spending.

Generate visual reports for insights.

Automated calculations for better financial decisions using AI.

# DOCUMENT PURPOSE AND AUDIENCE

1. This document is explaining the our vision in building a budgeting app software and how we planned to build it
2. IT is about a building and designing a budgeting app software that helps in organizing and monitoring the users pays and his taxes or any financial obligations

## TARGET AUDIENCE

1. Software Development Team
2. Stakeholders

# SOFTWARE SCOPE

1. Automated budgeting
2. Income and expenses tracking
3. manage personal transactions
4. Financial goal setting
5. advanced report insights
6. offline functionality

# DEFINITIONS & ACRONYMS

Budgeting	The process of creating a plan to manage income, expenses, and savings over a specific period
Fixed expenses	Recurring expenses that remain relatively constant, such as rent, loan payments, and subscriptions
variable expenses	Costs that fluctuate from month to month, such as dining, shopping, and utility bills.
emergency fund	A reserve of savings used for unexpected expenses like medical emergencies or job loss
E-wallet	Electronic Wallet (EX: Vodafone Cash, Fawry, Instapay)

# FUNCTIONAL REQUIREMENTS:

## User Experience & Financial Management

### User Onboarding & Authentication

FR01: Login/Sign-up screen on first use

FR02: Username & password input for secure login

### Transaction Handling & Entry

#### FR06: Payment details:

- Select wallet/account
- Assign category
- Enter amount (required), description, and optional notes

### Wallet & Expense Management

FR03: Users can manually add multiple wallets

FR04: Optional secure fields for bank/e-wallet integration

#### FR05: Expense categorization:

- Predefined categories (Food, Transport, Utilities, etc.)
- Custom category creation

FR11: Expense breakdown by category or wallet

# FUNCTIONAL REQUIREMENTS:

## Smart Automation & Financial Insights

### Real-time Financial Tracking

FR07: Dashboard displaying:

- Spending categories with allocated balances
- Quick fund addition & real-time updates

### AI-Powered Assistance & Alerts

FR08: AI chatbot for:

- Money-saving tips
- 24/7 financial FAQs

FR09: Notification center:

- Bill reminders
- Unusual spending alerts

### Reports & Secure Data Management

FR10: Report generation (PDF/CSV) with date filters

FR12: Local data backup & restore (.zip/.csv)

# NON FUNCTIONAL REQUIREMENT

## Performance:

- a. Core actions respond in <2s
- b. Reports generated in <5s

## Security:

- a. End-to-end encryption
- b. MFA & biometric login
- c. GDPR, CCPA, PCI-DSS compliance
- d. Regular security audits

## Usability & Accessibility:

- a. Intuitive UI with tutorials
- b. Multi-language support (English, Arabic)



# NON FUNCTIONAL REQUIRNEAMENT

## Reliability & Availability:

- 95% uptime with maintenance

## Compatibility:

- iOS, Android, Desktop support
- Responsive design for all devices

## Maintainability:

- 70% chance of fixing critical issues in 48 hours

## Scalability:

- Supports 10,000+ concurrent users
- Portability:
- Data export (CSV/Excel)

## Notifications:

- Real-time alerts for bills & budgets

# USER STORIES

## User Story #1:

### User Login and Sign Up

#### Description:

Users can sign up or log in to access their dashboard when they open the app.

Pre-Condition: App is opened.

#### Post-Condition:

User is registered/logged in and directed to the dashboard.

#### Acceptance Criteria:

1. Sign Up: New user enters valid details; system creates account and logs them in.
2. Login: Returning user enters correct credentials; system authenticates and shows dashboard.

#### expected scenarios:

1. System displays error: "Invalid credentials. Please try again."
2. System redirects to dashboard.

# USER STORIES

## User Story #2:

### Wallet Management (Manual + Integration)

#### Description:

The user wants to add or manage multiple wallets manually or link bank/e-wallet accounts to sync transactions.

**Pre-Condition:** User is logged in.

**Post-Condition:** Wallets are added and transactions are saved.

#### Acceptance Criteria:

1. Insert Wallet Manually: The user adds a wallet name and balance on the "Wallets" screen,
2. Bank Linking: The user links an external account, completes secure authentication

#### Expected Scenarios:

1. System opens wallet form.
2. System displays "Balance is required."

# USER STORIES

## User Story #3 :

### Expense Category Configuration

#### Description:

I want to categorize expenses using default categories (e.g., Food) or create custom categories for personalized tracking.

**Pre-Condition:** User is adding/editing a transaction.

**Post-Condition:** Categories are available in dropdowns.

#### Acceptance Criteria:

- **Default Categories:** Preconfigured options like Transportation are visible when categorizing a transaction.
- **Custom Categories:** When I click "Add Custom Category," name it, and save it, the category appears in the dropdown.

#### Expected Scenarios:

- System opens category form.
- System displays "Category already exists."

# USER STORIES

## User Story #4:

### Transaction Entry & Details

#### Description:

As a user, I want to log transactions with details like wallet source, category, amount, and notes to track spending accurately.

#### Pre-Condition:

User clicks "Add Transaction."

#### Post-Condition:

Transaction is saved and reflected in reports.

#### Acceptance Criteria:

Given I'm adding a transaction, when I select a wallet, category, enter an amount (e.g., \$30), and add a description (e.g., "Lunch"), the transaction is saved and visible in the dashboard.

#### Normal Scenario:

1. System validates inputs.
2. System updates wallet balance.

#### Exceptional Scenario:

3. System displays "Amount is required."

# USER STORIES

## User Story #5:

### AI Chatbot for Financial Support

#### Description:

As a user, I want to access a 24/7 chatbot for savings tips, expense avoidance strategies, and answers to common questions.

#### Pre-Condition:

User clicks the chatbot icon.

#### Post-Condition:

Chatbot interface opens.

#### Acceptance Criteria:

Given I ask, “How to reduce utility bills?”, the chatbot provides actionable suggestions (e.g., “Use energy-efficient appliances”).

#### Normal Scenario:

1. User types "How to save on groceries?"
2. Chatbot displays tips (e.g., "Buy in bulk").

#### Exceptional Scenario:

1. Chatbot server is down.
2. Users refresh the page.

# USER STORIES

## User Story #6:

### Proactive Alerts & Notifications

#### Description:

As a user, I want real-time alerts for bill reminders and unusual spending patterns to avoid financial risks.

Pre-Condition: User has bills or spending thresholds configured.

Post-Condition: Notifications are delivered.

#### Acceptance Criteria:

Given my credit card spending exceeds \$500 in a day, the system sends an alert: "Unusual spending detected."

#### Expected Scenarios:

- System detects pending payment.
- System sends push notification: "Electricity bill due in 2 days."



# USER STORIES

## User Story #7:

### Financial report Generation

#### Description:

A user wants to export a .PDF report with all his payments to print it.

#### Pre-Condition:

User goes to report and clicks on export button.

#### Post-Condition:

The file will be downloaded.

#### Acceptance Criteria:

Suppose I clicked on export button the file should be downloaded successfully on my phone and could open it.

#### Normal Scenario:

1. System generates report.
2. System downloads PDF to device.

#### Exceptional Scenario:

1. System generates report.
2. System downloads report to device with the wrong format.



# USER STORIES

## User Story #8:

### Expenditure Filtering by Category/Wallet

#### Description:

As a user, I want to filter transactions by category or wallet.

#### Pre-Condition:

User selects a category or wallet.

#### Post-Condition:

A filtered list with information is displayed.

#### Acceptance Criteria:

After selecting the category or wallet, all related transactions should appear to me as a user.

#### Expected Scenarios:

1. System displays all "Utilities" expenses.
2. System displays: "No transactions found for this category."



# USER STORIES

## User Story #9:

### Data Backup & Restoration

#### Description:

As a user, I want to export financial data as a backup file (.zip/.csv) and restore it later for data portability.

#### Pre-Condition:

User navigates to "Backup & Restore."

#### Post-Condition:

Data is exported/imported.

#### Acceptance Criteria:

**Export:** When I click "Export Backup," a .zip file is saved to my device.

**Restore:** When I select a backup file, all data is restored to the app.

#### Normal Scenario:

1. System compiles data.
2. System saves .zip file to device storage.

#### Exceptional Scenario:

1. User uploads a corrupted backup file.
2. System detects invalid format.
3. System displays: "Invalid backup file. Choose a valid .zip/.csv."



# USED TOOLS:

PlantUML: System modeling.

Google Docs: Documentation.

DeepSeek: Research & AI support.

Uiizard: UI prototyping.

Canva: for presentation slides

# RESTAURANT MANAGEMENT SYSTEM

## RESTAURANT MANAGER

1. ADD MENU ITEM: INPUT NAME, PRICE, DESCRIPTION, AND AVAILABILITY.
2. REMOVE MENU ITEM: REMOVE ITEMS USING THEIR UNIQUE ID.
3. VIEW MENU: DISPLAY AVAILABLE MENU ITEMS.
4. VIEW ORDER HISTORY: SHOWS COMPLETED ORDERS WITH DETAILS (ID, TYPE, DATE, ITEM BREAKDOWN, AND PRICES).
5. BACK: RETURN TO THE MAIN MENU.



## EXIT PROGRAM

1. DISPLAYS A MESSAGE AND TERMINATES THE APPLICATION.

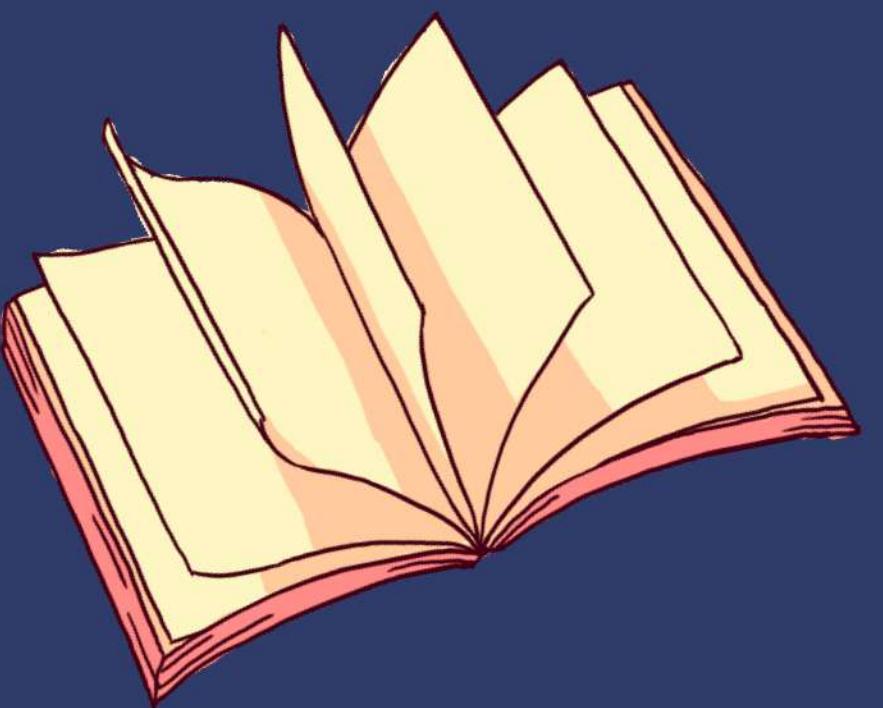
## CASHIER (ORDER MANAGER)

### ORDER TYPE SELECTION:

1. IN RESTAURANT: LABEL ORDER AS "IN RESTAURANT."
2. TAKEAWAY: LABEL ORDER AS "TAKEAWAY."
3. DELIVERY: COLLECTS CUSTOMER DETAILS (NAME, PHONE, ADDRESS, PAYMENT METHOD, AND DELIVERY FEE).

### ORDER PROCESSING:

1. DISPLAY MENU: SHOW AVAILABLE ITEMS.
2. MODIFY ORDER: ADD OR REMOVE ITEMS.
3. FINALIZE ORDER: PRINT ORDER DETAILS, CALCULATE TOTAL (INCLUDING DELIVERY FEES), AND SAVE ORDER HISTORY.



# LIBRARY MANAGEMENT SYSTEM

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- **Library Management System:**

A Java-based application designed to manage books, members, and transactions in a library.

- **Key Components:**

- **Book:** Represents a book with attributes like title, author, ISBN, availability, and price.
- **Member:** Represents a library member who can borrow and return books.
- **Librarian:** Manages books and members, and oversees transactions.
- **Transaction:** Tracks book borrowing and returning activities.
- **User:** Abstract class providing common functionalities like login and logout.

## FUNCTIONALITY

- **LIBRARIAN FEATURES:**

- ADD/REMOVE BOOKS.
- REGISTER NEW MEMBERS.
- VIEW ALL BOOKS, MEMBERS, AND TRANSACTIONS.

- **MEMBER FEATURES:**

- BORROW AND RETURN BOOKS.
- VIEW BORROWED BOOKS.

- **USER AUTHENTICATION:**

- BOTH LIBRARIANS AND MEMBERS CAN LOG IN USING THEIR EMAIL AND PASSWORD.
- SECURE ACCESS TO RESPECTIVE MENUS BASED ON USER TYPE.

# GYM MANAGEMENT SYSTEM

## MEMBER & TRAINER MANAGEMENT:

- ADD MEMBERS & TRAINERS WITH PERSONAL DETAILS (NAME, EMAIL, PHONE, AGE)
- MEMBERS HAVE FITNESS ATTRIBUTES (WEIGHT, HEIGHT)
- TRAINERS INCLUDE PROFESSIONAL DETAILS (SPECIALIZATION, EXPERIENCE)



## TRAINING SESSION BOOKING:

- MEMBERS BOOK SESSIONS WITH TRAINERS
- SESSIONS INCLUDE DURATION & USE THE CURRENT TIME AS THE SESSION DATE

## DATA DISPLAY & STORAGE:

- VIEW ALL MEMBERS, TRAINERS, AND BOOKINGS IN A FORMATTED LIST
- USES ARRAYLISTS FOR STORING MEMBER, TRAINER, & BOOKING OBJECTS WITH AUTO-GENERATED IDS

## SYSTEM FLOW:

- MENU-DRIVEN INTERFACE WITH 8 OPTIONS (ADD, CREATE, BOOK, DISPLAY, EXIT)
- INPUT VALIDATION ENSURES TRAINERS EXIST BEFORE CREATING PLANS & SESSIONS

## WORKOUT PLAN CREATION:

- TRAINERS CREATE PLANS WITH A NAME, DIFFICULTY, & MULTIPLE EXERCISES
- EXERCISES DEFINED BY NAME, MUSCLE GROUP, SETS, AND REPS (INPUT INTERACTIVELY)

*Thank You*

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