

# **MunsonMoney**

Revolutionizing International and  
Cross-Currency Transfers

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# Abstract

The MunsonMoney system engineering document outlines the conceptualization, design, and development framework for a cutting-edge money transfer application—MunsonMoney. This document serves as a comprehensive guide for stakeholders, developers, and users alike, capturing the project's key objectives, functional requirements, and performance criteria.

Beginning with an introduction to MunsonMoney, the document navigates through project objectives, stakeholder needs, and a detailed use case scenario. Stakeholder interviews and a thorough requirements analysis provide insight into the functional, performance, and constraint requirements essential for the application's success.

The functional analysis dissects the core features of MunsonMoney, focusing on currency management, user interface, and data acquisition. A conceptual design section outlines the graphical user interface and the underlying database functionality, ensuring a seamless and secure user experience.

The document emphasizes the importance of stakeholder collaboration, regulatory compliance, and ongoing verification processes. Clear and measurable performance requirements, including response times and data retrieval speed, set the standard for MunsonMoney's operational efficiency.

As a user-centric application, MunsonMoney promises a transparent and secure platform for international money transfers. This document serves as the guide for the development team to lead the project to success.

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# 1 Introduction

This project is an application which specializes in transferring money abroad. The name of this system shall be MunsonMoney. MunsonMoney offers a secure, encrypted way to transfer money at the most reasonable exchange rate, whether it be to others or to another account. Additionally, MunsonMoney offers an annual or biannual subscription plan that cuts fees entirely and enables users to transfer money at the exact exchange rate. These plans would be targeted at frequent travelers who would convert their currency often and want to skip conversion or transaction fees, as well as people who may need to make frequent transfers abroad to a friend or loved one. Users can choose to opt out of a subscription plan, and instead receive the normal service that charges transaction fees at a competitive rate. This document is intended to capture the main system functions, requirements of MunsonMoney's stakeholders, and application design patterns to initialize the development of a service that will be suitable to all parties.

## 1.1. Objectives

- Develop and implement a secure and efficient money transfer application named MunsonMoney.
- Provide users with a seamless and transparent platform for transferring money across territories and currencies.
- Offer competitive exchange rates to users, ensuring cost-effectiveness in currency conversion.
- Introduce annual or biannual subscription plans to reduce or eliminate additional fees for frequent users.
- Target frequent travelers and individuals with international connections as the primary user base.
- Establish partnerships with banks and financial institutions to facilitate secure and integrated money transfers.
- Ensure compliance with international, federal, and local financial regulations, prioritizing anti-money laundering and customer verification standards.
- Foster user trust through robust security measures, including two-factor authentication, encryption, and regular security audits

- Engage stakeholders effectively, including users, developers, financial institutions, marketing teams, regulatory bodies, and potential investors.

### 1.2 Approaches

- Conduct thorough requirements analysis to capture stakeholder needs and define the scope of the application.
- Prioritize and structure requirements to guide effective development of various features and mechanisms.
- Engage in stakeholder interviews to gather expectations, preferences, and concerns from users, developers, banks, marketing teams, regulatory bodies, and investors.
- Develop detailed use cases, such as the user transferring currency use case, to map out user interactions with the application.
- Establish a subscription model that is both fair to users and financially sustainable for the success of MunsonMoney.
- Implement robust security measures, including two-factor authentication, data encryption, and regular security audits, to ensure the safety of financial transactions.
- Conduct performance testing to guarantee quick response times and stability, even during peak usage hours.
- Design a user-friendly interface with a focus on intuitive navigation and clear presentation of account information and transaction history.
- Ensure scalability to accommodate future growth in user activity and transaction volume.
- Adhere to regulatory compliance standards, including annual audits and continuous updates to meet legal requirements.
- Allocate sufficient financial resources to cover operational expenses, security measures, customer support, and legal fees.

### 1.3. Key Stakeholders

The full stakeholder requirements and analysis documentation can be found in Section 1.1 in the appendix<sup>[A-2]</sup>. The following is a condensed version of its findings and insights.

- Users

Users are the individuals who would use the app to send or receive money. They would be interested in quick and secure transfers as well as transparent fees and pricing.

- Developers

Developers would be the ones developing the app which includes designing, debugging, UX, security, and deploying new features.

- Banks/Financial institutions

Banks that would be partnered with MunsonMoney in order to facilitate transfers would be interested in security, integration, regulatory compliance, and brand image.

- Marketing teams

Marketing teams are responsible for recruiting new users, and therefore would be interested in the app's competitive advantages and features.

- Government regulatory bodies

With any system dealing with the exchange of money, the government will be heavily involved. They will be interested in making sure that MunsonMoney complies with all financial regulations, such as ones regarding money laundering.

- Investors

If MunsonMoney becomes public, then potential investors will be interested in the app's performance to receive a return on their initial investment.

The success of the MunsonMoney project is intricately linked to the relationship between the project team and stakeholders. Stakeholders, ranging from product users and financial institutions, to regulatory bodies and investors, play a vital role in guiding the project's direction and success. The project team relies on stakeholders for essential development resources, including user feedback, financial support, legal counsel, and partnerships. In turn, stakeholders depend on the project team to deliver a secure, user-friendly, and compliant money transfer application. The feedback loop between the project team and stakeholders ensures that the application aligns with user expectations, regulatory standards, and market demands. Developers and marketing teams, who also function as stakeholders, are uniquely positioned within the project team, contributing not only to the creation of the application, but also actively participating in its success. This interconnected collaboration forms the

foundation for a dynamic and responsive development process, resulting in a product that meets the diverse and evolving needs of stakeholders.

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## 2 Requirements Analysis

The requirements analysis as found in Section 1 of the appendix<sup>[A-2]</sup> for MunsonMoney defines and explores the essential functionalities and constraints of the system. The process of documenting these requirements involved the collection of stakeholder needs, including the user expectations for a seamless and secure money transfer experience, to the demands of partner financial institutions and regulatory bodies for compliance and security. Through a combination of use case scenarios, stakeholder interviews, and project brainstorming, the functional, performance, constraint, and verification requirements were able to be captured.

Functionally, MunsonMoney is developed to facilitate user registration, securely transfer money, and provide real-time exchange rate information for a wide variety of currencies. Two-factor authentication and a transaction history feature add layers of security and transparency. The performance requirements outline expected response times, concurrent user support, and expected scalability to ensure a smooth and responsive user experience. The constraints focus on regulatory compliance, data privacy, system availability, security audits, and financial resource allocation.

This requirements analysis serves as the blueprint for the subsequent phases of development, and provides a clear roadmap for creating a detailed and user-centric money transfer application which will satiate all stakeholder expectations and applicable regulatory standards. Through ongoing stakeholder engagement and iterative improvements, MunsonMoney aims to evolve with the evolving needs and expectations of the market and its users.



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## 3 Functional Analysis

The functional analysis as found in Section 2 of the appendix<sup>[A-9]</sup> of MunsonMoney delves into the core capabilities and features that define its operational framework. This systematic examination identifies three key macro functions: Currency Management, User Interface, and Data Acquisition.

Within the most complex macro function, Currency Management, three more sub-functions are defined: User Accounts, Exchange Rates, and Subscription Service. The User Accounts sub-function encompasses user abilities such as opening/closing currency accounts, viewing balances, adding funds, and transferring funds between accounts. Historical rates, widgets, rate alerts, and currency conversion functions fall under the umbrella of Exchange Rates. Closing out this first section, the Subscription Service function includes subscribing, managing subscriptions, and handling subscription billing.

The second macro function is the User Interface functionalities. These functionalities cover aspects such as login and registration, as well as overview and navigation screens displaying account information, including specific pages for managing currency accounts, transfers, recipients, and settings.

Finally, the Data Acquisition functions encompass retrieving currency data, user data, and fetching transfer status information.

This functional analysis serves as a compass for the development team, providing a clear breakdown of essential features and their connections. It lays the foundation for creating a smooth and intuitive user experience, while ensuring that the system effectively manages diverse currencies, real-time exchange rates, and user subscription plans.

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## 4 Conceptual Design

The conceptual design as found in Section 3 of the appendix<sup>[A-12]</sup> of MunsonMoney sets the stage for the overall architecture and user interface of the system, defining how users interact with the application and outlining the database structure. At its core, this design is intended to empower users with secure and cost-effective currency management solutions. The three aforementioned macro functions — Currency Management, User Interface, and Data Acquisition — form the foundational pillars of this system and its design.

The graphical user interface (GUI) design of MunsonMoney is meant to be simple and eye-catching, utilizing the punchiness of orange as its brand color to highlight the most important buttons on the application. Navigating MunsonMoney is designed to be as straightforward as possible for the user, which is why every necessary page can be found in the same sidebar, and page attributes are limited to be only the most vital functions.

This simplicity and user-friendliness is followed to the back end of the application, where the databases are simple and secure to ensure productivity and ease of communication within the development team. There are five main tables, as illustrated in Figure 4 in the appendix<sup>[Figure 4]</sup>. These will be the UserAccounts table responsible for all personal user data, the CurrencyManagement table that will store information related to currencies and exchange rates, which is related to the CurrencyAccount table, holding individual currency account details, and of course a Subscription table for data regarding a user's subscription plan, and a TransactionHistory for added data transparency.

The detailed functions and their subcomponents are laid out in the design process, guiding the development team in creating an application that seamlessly integrates currency-related operations with an intuitive user interface. This conceptual design acts as a blueprint for MunsonMoney, ensuring a robust foundation for future development and potential future features.

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## 5 Conclusion

In conclusion, this MunsonMoney system engineering document outlines a comprehensive framework that will be the cornerstone of the development of a robust and user-friendly money transfer application. From the initial exploration of project objectives, to the detailed analysis of stakeholder needs, functional requirements, and performance criteria, this document serves as a foundational guide for the development team.

The identification of key stakeholders including users, developers, financial institutions, marketing teams, government regulatory bodies, and potential investors, emphasizes the diverse considerations that must be accounted for in the development process. Understanding and addressing the unique needs of each stakeholder group will be pivotal in ensuring the success of MunsonMoney.

The requirements analysis section provides a detailed breakdown of functional, performance, constraint, and verification requirements. These requirements, ranging from user authentication to scalability and security audits, form the basis for the development team's roadmap. Clear and measurable performance criteria, such as response times and concurrent user support, set the standard for a seamless and efficient user experience.

The functional analysis dives into the core functions of MunsonMoney, covering currency management, user interface, and data acquisition. The breakdown of functions into subsections provides a clear understanding of the application's structure, which in turn will facilitate effective development and testing strategies.

The conceptual design section presents the GUI and database functionality. The GUI design ensures a user-friendly experience, allowing users to navigate seamlessly through various screens such as login, account management, and currency transactions. The database functionality, with its well-defined tables and required information, forms the backbone of MunsonMoney, ensuring secure storage and easy retrieval of user data.

In the coming stages of development, adherence to the outlined constraints, rigorous verification processes, and ongoing collaboration with stakeholders will be crucial. Regular updates to security measures, compliance with regulations, and user-centric design will contribute to the long-term success of MunsonMoney.

In summary, this system engineering document lays the groundwork for the development of MunsonMoney, providing a roadmap that balances the needs of stakeholders, technical requirements, and user experience. As the project progresses, fervent attention to the principles outlined within this documentation will guide the team towards the delivery of a cutting-edge, revolutionary money transfer application that meets the expectations of users, stakeholders, and the market alike.

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## References

- [1] “AML Guidance for Money Transfer Companies.” SanctionScanner.com Sanction Scanner, 2019, [sanctionscanner.com/blog/aml-guidance-for-money-transfer-companies-169](https://sanctionscanner.com/blog/aml-guidance-for-money-transfer-companies-169).
- [2] “Currencies.” Bloomberg.com, Bloomberg, 2023, [www.bloomberg.com/markets/currencies](https://www.bloomberg.com/markets/currencies).
- [3] GeeksforGeeks. “Designing Use Cases for a Project.” *GeeksforGeeks*, 15 Dec. 2022, [www.geeksforgeeks.org/designing-use-cases-for-a-project/](https://www.geeksforgeeks.org/designing-use-cases-for-a-project/).
- [4] Geller, Michael, and Arpita Sarkar. “Fintech and the Future of Finance.” *World Bank*, World Bank Group, 13 July 2023, [www.worldbank.org/en/publication/fintech-and-the-future-of-finance](https://www.worldbank.org/en/publication/fintech-and-the-future-of-finance).
- [5] JPMorgan Chase Mentor. “Tips for Fintech Startups on Partnering with Banks.” *JPMorgan Chase & Co.*, Financial Solutions Lab, 2023, [www.jpmorganchase.com/news-stories/acarson-tips-fintech-startups](https://www.jpmorganchase.com/news-stories/acarson-tips-fintech-startups).
- [6] Radview Team. “Types of Load Testing and When Each Should Be Used.” *Load Testing Software and Web Load Testing Solutions from Radview*, 9 Sept. 2021, [www.radview.com/blog/4-types-of-load-testing-and-when-each-should-be-used/?utm\\_source=google&utm\\_medium=paid&utm\\_campaign=15355930&utm\\_content=150946899774&utm\\_term=&gadid=676875403608&gad\\_source=1&gclid=CjwKCAiAmZGrBhAnEiwAo9qHiYcgycq3yBxNwVIEPE1Z4o6n6LupGb9Z9jCXBpmNjzN0BpwMD28XpRoCI4kQAvD\\_BwE](https://www.radview.com/blog/4-types-of-load-testing-and-when-each-should-be-used/?utm_source=google&utm_medium=paid&utm_campaign=15355930&utm_content=150946899774&utm_term=&gadid=676875403608&gad_source=1&gclid=CjwKCAiAmZGrBhAnEiwAo9qHiYcgycq3yBxNwVIEPE1Z4o6n6LupGb9Z9jCXBpmNjzN0BpwMD28XpRoCI4kQAvD_BwE).
- [7] Sakovich, Natallia. “Guidelines for Developing a Mobile Banking App.” *SaM Solutions*, 30 Oct. 2023, [www.sam-solutions.com/blog/mobile-banking-app-development/](https://www.sam-solutions.com/blog/mobile-banking-app-development/).
- [8] The Investopedia Team. “Foreign Transaction Fee: Definition, How It Works, and Example.” *Investopedia*, Erika Rasure, 25 June 2023, [www.investopedia.com/terms/f/foreign-transaction-fee.asp](https://www.investopedia.com/terms/f/foreign-transaction-fee.asp).
- [9] Tomych, Igor. “Top Fintech Web Back End Technologies and Platforms.” *DashDevs*, 1 Feb. 2023, [dashdevs.com/blog/fintech-back-end-development-which-technologies-to-base-your-product-around/](https://dashdevs.com/blog/fintech-back-end-development-which-technologies-to-base-your-product-around/).
- [10] Underwood, Jenn. “Foreign Transaction Fees vs. Currency Conversion Fees: What’s the Difference?” *Forbes*, Forbes Magazine, 2 Oct. 2023, [www.forbes.com/advisor/credit-cards/foreign-transaction-fees-vs-currency-conversion-fees/](https://www.forbes.com/advisor/credit-cards/foreign-transaction-fees-vs-currency-conversion-fees/)

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# Appendix

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# 1 Requirements Analysis Documentation

The needs of stakeholders as obtained from potential use cases and stakeholder interviews.

## 1.1 Gathering Stakeholder Needs

A potential use case<sup>[Figure 1]</sup> of a user transferring currency from the United States to Hungary:

1. The user inputs his/her login credentials.
2. An SMS, email, or authenticator app code is sent to the user as a 2FA method.
3. The system verifies the credentials.
4. The user is presented with their account's home screen where they can choose to use any of the app's functionalities.
5. The user selects the "Transfer" option
6. The system asks the user to select which account he/she would like to transfer money from.
7. The user is prompted to enter the recipient's account details.
8. The system presents the user with the real-time currency exchange rate and calculated currency equivalent, and the options to complete or void the transaction.
9. The user selects the "Complete Transaction" option.
10. The system processes the request.
11. The system displays a screen that verifies the transaction was accepted.
12. The user is returned to step 4.
13. The user selects the "Transfer History" option.
14. The system retrieves the user's recent transaction history.
15. The user's recent transactions and their statuses are displayed.
16. The user quits this screen.
17. The user is returned to step 4.

Use Case Extensions:

3.1 Login credentials are not valid

3.1.1 The system displays an error message above the login page

9.1 The user voids their transaction

9.1.1 The system displays a “Transaction Voided” confirmation message

9.1.2 The user is returned to step 4

11.1 The system notifies the user that the transaction was not accepted

11.1.1 The user is taken back to step 6

## Interviews

The following are expectations of potential stakeholders collected through an interview process:

- Users
  - A reasonable and fair subscription pricing based on market analysis and other factors
  - Acceptance of international cards/banks
  - Responsive application, limited downtime
  - 24/7 customer service line
- Partner financial institution
  - Transparent financial information
  - Reasonable interest rate
  - Recruit new members
  - Secure monetary transfers, including 2FA, biometric data, encryption, holding suspicious payments, etc
- Government regulatory bodies
  - Tax reports filed
  - Compliance with all laws in applicable location
  - ID verification to use MunsonMoney
- Investors
  - Cash flow projection for the application
  - Risk management and proper accounting
  - Transparency with inner workings of the company
  - Customer loyalty measures
- Marketing teams
  - Resources in place to receive frequent customer feedback
  - Ease of communication between teams



- Frequent update rollouts to refresh advertising strategies
- Developers
  - Detailed design plan
  - Strategic management hierarchy
  - Reasonable delegation of tasks

## 1.2 Functional Requirements

### User verification

MunsonMoney shall allow users to register for an account with a valid email address or phone number as password along with a valid ID. Upon registration, the user will receive an email or SMS message to confirm their account. The user's ID will be manually reviewed and confirmed within 24hrs.

### Money transfers

MunsonMoney shall enable users to initiate monetary transfers by providing the recipient's information, which will include the recipient's account number and the desired transfer amount. The user will also be able to choose if the transaction is one-time or recurring.

### Two-factor authentication (2FA)

MunsonMoney shall require a 2FA mechanism in order to enhance the application's security and the security of partner financial organizations. Users can choose to receive a one-time code each login through email, SMS, or an authenticator app.

### Transaction History

MunsonMoney shall maintain a viewable transaction history for each user that displays transaction date, amount, recipient information, and the status of the transaction (e.g., pending, successful, or failed). Users will have the ability to export this history.

### Exchange rate calculation

MunsonMoney shall retrieve and display real-time currency exchange rate conveniently for each user based on the International Monetary Fund. This data will update whenever the page is reloaded. The system will calculate and display the currency equivalents before the user confirms the transaction.

### Multi-currency support

MunsonMoney shall support the 52 world currencies. Support is defined as users being able to send and receive money, as well as hold accounts in the currency. Users can hold all 52 currencies at once, if desired. Users will select their preferred currency before each transaction, and currency conversion will be handled transparently.

### Subscription prompting/management

MunsonMoney shall charge subscribers an annual or bi-annual rate depending on their chosen plan. Subscribed users will be notified when their subscription is about to renew or end. Unsubscribed users will be notified of how much money they could've saved with each transaction in order to encourage new sign-ups.

## 1.3 Performance Requirements

### Response time

MunsonMoney shall respond to a user's action within 2 seconds for a standard operation (e.g., logging into the application, initiating a transfer, or viewing transactions). This time is measured as the time between the user's request being sent and the response being displayed.

### Concurrent user support

MunsonMoney shall support 1,000 users during peak hours without a noticeable degradation in stability or response time. Peak usage hours are defined as the busiest 2-hour window every day.

### Data retrieval speed

MunsonMoney shall retrieve and display real-time exchange rates (from the International Monetary Fund) and the user's transaction history within a maximum time of 1 second.

### Scalability

MunsonMoney shall be capable of horizontal scaling in order to accommodate increased user activity. Within six months, it will be able to support a 50% increase in user activity and transaction volume.

### Load testing

MunsonMoney shall undergo load testing using simulations of user traffic to test its performance under stressful conditions. These tests will simulate 10,000 concurrent users to test response time, resource use, and errors<sup>[6]</sup>.

## 1.4 Constraint Requirements

### Regulatory compliance

MunsonMoney shall comply with all regulations at the international, federal, and local level. Regulations include anti-money laundering and know your customer requirements. The system will be audited and updated annually or after any legal issues in order to ensure continuous compliance<sup>[1]</sup>.

### Data privacy

MunsonMoney shall adhere to all data privacy and protection standards, ensuring that all user data, financial information, and transaction details are securely stored. All laws in applicable regions will be adhered to.

### Availability and uptime

MunsonMoney shall maintain a 99.9% uptime standard over a 1-month window, which excludes planned maintenance times. Planned downtime will be communicated to users 3 days in advance and will be scheduled during non-peak hours.

### Security audits

MunsonMoney shall undergo security audits biannually, or after a significant event within the IT infrastructure. There will be penetration testing by third parties quarterly, and security patches will be rolled out monthly.

### Financial resources

MunsonMoney shall be allocated sufficient resources toward operational expenses such as server expenses, customer support, security measures, and legal fees. Sufficient is defined as enough money to not hinder the normal flow of operations<sup>[7]</sup>.

## 1.5 Verification Requirements

### User authentication testing

MunsonMoney shall undergo testing of its user authentication mechanism (e.g., 2FA, login credentials, or password reset) to ensure that only authenticated users are able to access their accounts.

### Regulatory compliance testing

MunsonMoney shall undertake regulatory compliance verification, in which a compliance audit will assess and document the system's compliance with relevant regulation.

### Data security

MunsonMoney shall experience testing of its encryption and access control features in order to verify the security of the system, This will include penetration and vulnerability testing.

### Currency exchange accuracy

MunsonMoney shall be subjected to verification of its displayed exchange rate functionality. Test transactions will confirm that the system is calculating exchange rates and currency equivalents accurately.

### Performance testing

MunsonMoney's performance shall be substantiated through load, stress, and performance testing. The tests will monitor the resource utilization, response times, and scalability under simulations of 100-10,000 users.

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## 2 Functional Analysis Documentation

MunsonMoney was designed to cater to the various needs and expectations of our respected stakeholders, which mainly includes users seeking coherent currency management solutions. Three key macro functions have been selected from in-depth stakeholder input, market research, and a commitment to delivering an extensive and user-friendly experience. The primary functions encompass Currency Management, User Interface, and Data Acquisition. Together, these functions form the foundation of MunsonMoney's core mission to provide a world-class currency transferring platform, tailored to empower our users with the ability to efficiently manage multiple currencies, access real-time exchange rates, and leverage our subscription service for a truly fee-free experience.

### 2.1 Currency Management

#### User Accounts

- Open New Currency Account
- Close Currency Account
- View Currency Account Balance
- Add Funds to Currency Account
- Transfer Funds Between Currency Accounts

#### Exchange Rates

- Display Retrieved Exchange Rate
- View Historical Exchange Rates
- Set Exchange Rate Widget to Desired Currency
- Set Currency Exchange Rate Alerts
- Currency Conversion

#### Subscription Service

- Subscribe to Service
- Manage Subscription

- Subscription Billing

## 2.2 User Interface

### User Registration and Login

- Verify User
- Register User
- Forgot Password
- Send 2FA Code

### Overview and Navigation

- Overview of Currency Accounts
- User Information
- Links to main pages
- Subscription Status

### Currency Account Management

- View Currency Account Balances
- Add Currency Account
- Remove Currency Account
- Fund Transfer

## 2.3 Data Acquisition

### Retrieve Currency Data

- Retrieve Real-Time Exchange Rates
- Retrieve Historical Exchange Rates
- Fetch Currency Account Balances

### Retrieve User Data

- Get User Account Information

- Fetch User Subscription Status
- Authenticate 2FA

### Retrieve Transfer Status

- Perform frequent background refreshes
- Display live status of transfer

### Summary

The three main components of MunsonMoney are the ability to login, hold currencies, transfer funds, and to convert currency. These main functions and their subcomponents are covered here as well as the hierarchical structure of the application's functions<sup>[Figure 2]</sup>.



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## 3 Conceptual Design Documentation

This document will serve as the basis for the user interface of the system and as the outline for the database design.

### 3.1 Summary of Design<sup>[Figure 3]</sup>

#### Login Screen

Main functionality: Application Entry Point

- Allows users to log in to their MunsonMoney account.

Key Elements:

- Username and password input fields
  - Pulls up user's keyboard so they can enter their email/password
- "Login" button
  - Links user to Home Screen + Navigation Sidebar
- "Forgot Password" link
  - Sends user a code through their linked email or phone number
- "Register" link.
  - Links user to the Register screen

#### Create Account Screen:

Main functionality: User Registration

- Enables new users to create a MunsonMoney account.

Key Elements:

- Registration form fields (e.g., name, email, password)
  - Pulls up user's keyboard so they can enter their info
- Password strength progress bar
  - Displays the strength of the entered password
- TOS Agreement check box
  - Allows user to click the "Create Account" button
- "Create Account" button
  - Link to the login screen.
- "Sign In" link
  - Links back to the last page

#### Navigation Sidebar

Main Functionality: Application Navigation

- Displays the app's main pages and links to them

Key Elements:

- Subscription data
- “Home” button
  - Links to Home Screen
- “Transfer” button
  - Links to Transfer Screen
- “Recipients” button
  - Links to Recipients Screen
- “Manage” button
  - Links to Manage Screen
- “Settings” button
  - Links to Settings Screen

Home Screen:

Main functionality: User Dashboard

- Displays an overview of the user's account and currency balances.

Key Elements:

- User account information
- Currency account balances
- “Manage Subscription” link
  - Lets users cancel or upgrade their subscription, or change their method of payment
- "See All" transactions link
  - Views more in-depth transaction info and the ability to search for transactions
- “Edit” exchange rate link
  - Allows user to choose which currency they want on their widget

Transfer Page:

Main functionality: Currency Transactions

- Allows users to initiate currency transfers and conversions.

Key Elements:

- Account/Currency selection
  - Dropdown menu of user’s available accounts
- Transfer amount input field
  - User input, only accepts numbers and a period
- Recipient selection
  - Dropdown menu of saved recipients, and the option to add new

- Frequency” input selection
  - Opens small pop-up calendar to choose recurring or scheduled payments, otherwise the default is One-Time
- “Memo” input field
  - Optional field for a description of the transfer or why it was sent
- “Continue” button
  - Checks that all fields are correct and lets the user review their transfer

## Recipients Page:

Main functionality: Recipient Management

- Provides options to add, edit, or delete saved recipients for quicker transfers.

Key Elements:

- List of saved recipients/contacts
- "Add Recipient" button
  - Prompts user for recipient details
- "Edit" and "Delete" options for each recipient (swipe)
  - Views recipient details / removes recipient
- “Send” button for each recipient
  - Links to Transfer Screen with the Recipient field already filled
- “Groups” link
  - Make or manage a recipient group

## Manage Screen:

Main functionality: Currency Account Management

- Offers users the ability to add, remove, or view their currency accounts.

Key Elements:

- List of currency accounts
- "Add Account" link
  - Asks user to choose the currency to create the account in
- “Edit” account link
  - "Remove" link
- Account details
  - Displays the IBAN, bank number, etc of the selected account

## Settings Screen

Main functionality: User Account Management

- Offers users the ability to log out, change their details, or set up 2FA

Key Elements:

- “Logout” button
  - Logs out user
- “Edit Details” link
  - Lets user view + change their email, password, etc
- 2FA button
  - Lets user set up or change their 2FA options

## 3.2 Database Functionality and Design

The MunsonMoney app relies on a well-designed database system to effectively handle the growing and dynamic financial transactions taking place on its platform. This database is the heart of the platform, storing vital details like user accounts, various currencies, transaction histories, and subscription information. Its job is to securely store user data, enabling individuals to manage accounts in different currencies and easily transfer funds between users. The tables in the database capture important information, including user profiles, currency balances, transaction records, subscription status, and currency account details. By systematically organizing and storing this data, the database ensures a reliable and straightforward user experience. MunsonMoney users expect accurate and secure financial transactions, and the benefit of a subscription service that enables them to move their money with minimal fees.

### 3.2.1 Required Information:

For a model database design encompassing these tables, consult Figure 3<sup>[Figure 3]</sup>.

User Accounts table:

the user’s personal details to allow for a smooth and secure login.

- 2.1.1. User ID
- Name
- Password
- Email
- Subscription Status

### Currency table:

the current valuation of a currency in order to perform accurate currency conversion.

- Currency Code (USD, EUR, GBP)
- Currency Name
- Exchange Rate

### Transaction History table:

the data regarding each transaction which will be used to retrieve a transaction history that is able to be filtered by different variables (time, amount, account, etc).

- Transaction ID
- Sender ID
- Receiver ID
- Amount
- Currency Code
- Date and Time Stamp
- Status
- Account ID

### Subscription table:

the subscription status and details of the user, which will be used when calculating fees.

- Subscription ID
- User ID
- Subscription Start Date
- Subscription End Date
- Subscription Type
- Fee Status

### Currency Account table:

the details of the user's individual currency accounts which includes account number, currency, IBAN, etc. The user will need access to this information to initiate transactions, but it will be kept securely otherwise.

- Account ID

- User ID
- Name
- Currency Code
- Balance
- IBAN
- SWIFT/BIC Code
- Routing Number
- Transaction History

Figure 1: Use Case Diagram

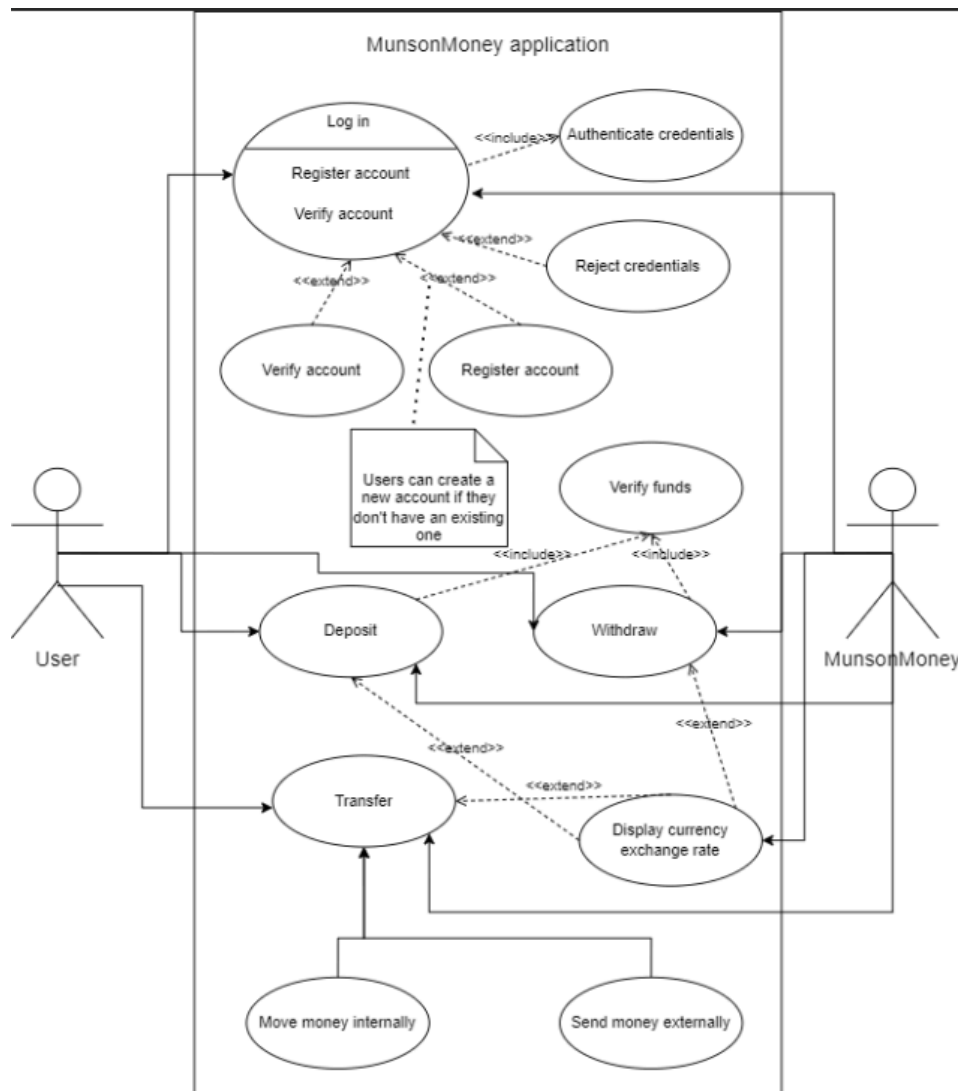


Figure 2: Functional Flow Block Diagram

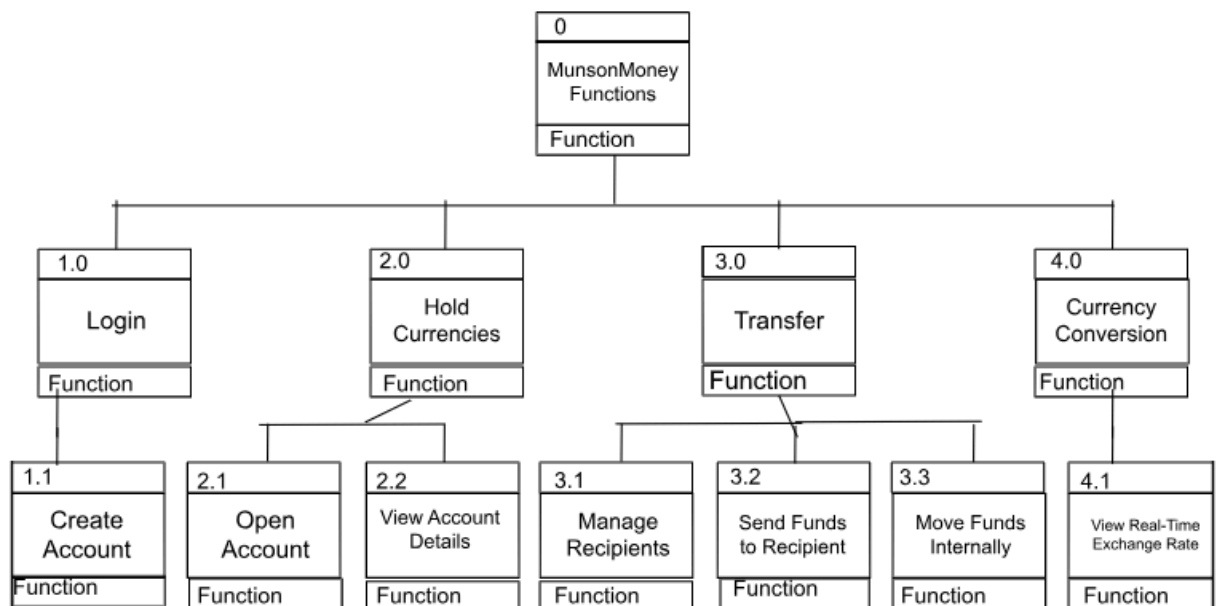




Figure 3: GUI Design

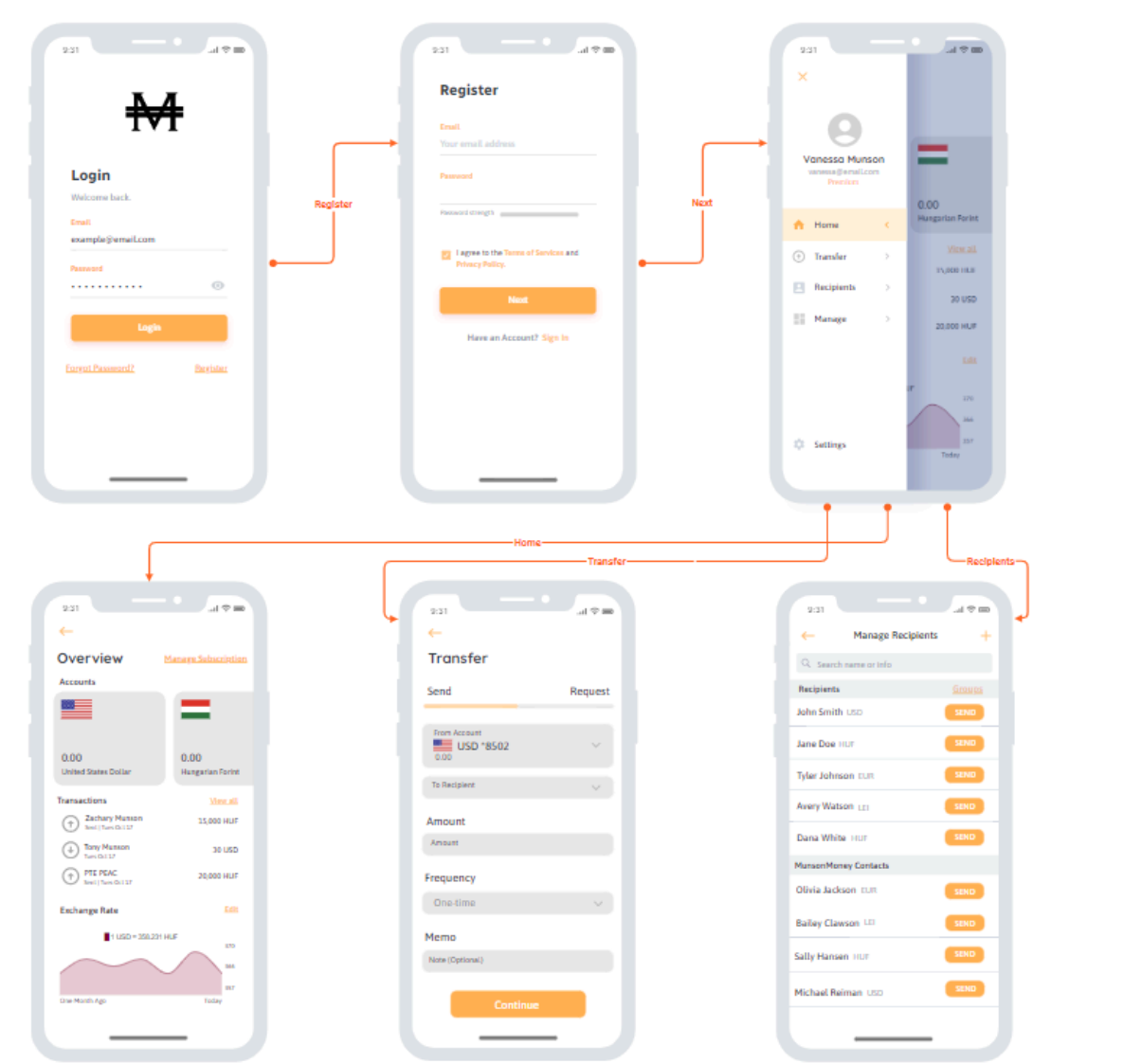


Figure 4: Database Design

