

TED UNIVERSITY

Faculty of Engineering

Department of Computer Engineering

**CMPE 491 – Project Specification Report**

by

Arda Ertürk

Bora Kutun

Ece Atakol

Sarp Arslan

25.10.2024

**1. Introduction**

**1.1 Description**

Envolet is an user-friendly budget planning and tracking tool that encourages sustainable living while helping users save money. Artificial intelligence (AI) will be used by the program to evaluate user spending patterns and deliver actionable insights in the form of personalized text-based recommendations and visual diagrams. Envolet helps consumers save money and make more environmentally responsible purchases by pointing out wasteful expenditure and offering substitutes.

The application's backend will be developed using Node.js and Express.js to ensure effective data processing and API management. Firebase will take responsibility for providing user secure authentication. MongoDB, which provides a configurable structure for tracking user transactions and spending patterns, will be used for data storage. In order to provide customers with seamless access to their financial data and insights on the go, a Flutter mobile app will be created for iOS and Android devices.

**1.2 Constraints**

Economic Constraints

Envolet will need to operate within a limited budget, particularly in terms of hosting costs and the ongoing use of Firebase and AI services. Efforts will be made to benefit from cost-effective cloud services and reduce costs by optimizing backend operations.

Environmental Constraints

Envolet's goal is to promote sustainability, so it must ensure that server energy usage and resource consumption have the least environmental impact possible. The app will assist users in making ecologically responsible selections, but also the development team will make every effort to choose eco-friendly hosting options.

Social Constraints

The application will be inclusive, appealing to a diverse variety of users from various socioeconomic backgrounds. The AI must avoid bias, particularly when making expenditure suggestions based on demographic information.

Ethical Constraints

Envolet must be transparent about how it uses user data. All AI-based recommendations should be fair, neutral, and focused on the well-being of the users. Ethical data gathering and processing will be a top priority.

Manufacturability Constraints

The app is software-based, therefore manufacturability is not an issue. However, the team must guarantee that the software is scalable and easy to maintain for future updates and expansions.

Sustainability Constraints

Envolet's long-term sustainability will require careful consideration of both technical infrastructure and user experience. The app must be built to consume less energy and waste as little server resources as possible. The application's main focus is on promoting sustainable lifestyles through AI recommendations.

**1.3 Professional and Ethical Issues**

Professional Responsibilities

As developers, it is our responsibility to provide a product that is dependable, secure, and user-friendly. This includes maintaining a high level of code quality, following best practices in software development, and extensively testing the app for performance and security. Regular updates will be made to fix bugs and improve the user experience.

Ethical Responsibilities

From an ethical standpoint, we must prioritize user privacy and data security. Envolet will follow strict privacy regulations when dealing with sensitive financial information, ensuring that all data is anonymized and securely encrypted wherever possible. Additionally, the AI recommendations will be intended to promote financial wellness without exploiting user vulnerabilities and avoid manipulative or dangerous advice.

**2. Requirements**

**Functional Requirements:**
- User Registration & Login: Using Firebase authentication, users can register and log in.
- Budget Planning: Users are able to monitor their expenditure in many categories and establish budget goals.
- Spending Analysis: AI will examine consumer spending patterns to pinpoint areas where consumers might make financial savings.
- Recommendations: Based on text analysis, the app will provide customized suggestions for more environmentally friendly spending.
- Visualization: For ease of interpretation, spending data will be displayed in the form of visual diagrams (such as charts and graphs).

- Mobile Access: All functionalities will be cross-platform accessible through a mobile app built with Flutter.

**Non-Functional Requirements:**
- Security: User authentication must be handled securely with Firebase, and data must be encrypted.
- Scalability: Without compromising performance, the system should be able to accommodate an increase in users and data.
- Usability: The application will have a user-friendly interface for navigation.
- Performance: The application ought to react promptly to user inputs and offer suggestions in real-time.

**3. References**

- Firebase documentation: <https://firebase.google.com/docs>

- Node.js with Express.js documentation: <https://expressjs.com>

- MongoDB documentation: <https://www.mongodb.com/docs>

- Flutter documentation: <https://flutter.dev/docs>