Report on "UNI-PAY"

Perfect Palindromes

February 4, 2024

Group Members

1. IIT2022247
2. IIT2022244
3. IIT2022236
4. IIB20022041
5. IIB2022015

A. Feasibility

Technical Feasibility: The project's technical feasibility is high, given the availability of well-established technologies for mobile app development and secure payment processing. The team possesses a robust skill set in app development and system integration, ensuring the successful implementation of required features within the semester timeframe.

Operational Feasibility: Operationally, the payment app seamlessly integrates with the university's existing infrastructure. The proposed integration with student databases and financial systems is not only achievable but also enhances the overall operational efficiency. The user interface is designed with a focus on user-friendliness, ensuring a practical and positive experience for both students and receiving entities.

B. Novelty

Problem Identification: The project identifies and addresses key challenges faced by students in managing university-related transactions. It specifically targets issues related to transaction complexities, delays, and lack of a unified solution within the university ecosystem.

Solution Uniqueness: The proposed app stands out from existing payment systems by offering a tailored solution exclusively designed for university transactions. Its distinctive features, including monthly credit allocations and seamless transfer mechanisms, differentiate it from generic payment apps in the market. This uniqueness ensures a more tailored and efficient solution for the university community.

C. Challenge

Complexity: The project's complexity stems from intricate transaction processes that require a collaborative effort from a team of 4-6 individuals throughout the semester. Security measures, real-time transaction updates, and a user-friendly interface pose challenges that demand careful consideration. The team's collective expertise will be crucial in overcoming these challenges and delivering a robust solution.

Scope: The project's scope extends beyond basic transaction processing. Incorporating features such as monthly credits and detailed reporting adds to its non-trivial nature. These complexities highlight the need for a dedicated team with diverse skills to ensure the successful implementation and delivery of a comprehensive payment app.

D. Real-world Applicability

Societal Impact: The payment app's broader societal implications include addressing financial challenges faced by students. By streamlining financial processes, it contributes to a more efficient and stress-free academic experience.

Applicability: Initially designed for university use, the app's modular structure allows for adaptation to various educational institutions. Its functionalities can be extended to address financial management challenges in other settings, making it a versatile solution.

Partnerships with Merchants: Establishing partnerships with on-campus and local merchants enhances the app's adoption. Exclusive deals, discounts, or cashback offers create a more attractive proposition for users.

AI-driven Financial Insights: Implementing artificial intelligence algorithms for analyzing spending patterns and providing personalized financial insights adds a layer of sophistication. This promotes smart financial habits among users.

E. Informal List of Requirements

Requirement ID	Description
REQ-01	User registration: Allow students and entities to register an account with the app.
REQ-02	Authentication: Implement a secure login system for registered users.
REQ-03	Transaction processing: Enable users to initiate and complete transactions securely.
REQ-04	Monthly credit allocation: Implement a system for monthly credits to student accounts.
REQ-05	Notification system: Provide real-time updates and notifications for transactions and account activities.
REQ-06	Security measures: Implement encryption and other security measures to protect user data.
REQ-07	Reporting and analytics: Generate comprehensive reports on transactions and account activities.
REQ-08	User feedback: Include a feedback mechanism for users to submit their opinions and suggestions.
REQ-09	Customer support: Integrate a support system to address user queries and issues.
REQ-10	Multi-platform compatibility: Ensure the app works seamlessly on both Android and iOS platforms.
REQ-11	Database management: Use MongoDB through Mongoose ODM for efficient and secure storage of user data and transaction records.
REQ-12	Offline functionality: Allow certain features to be accessible even without an internet connection.
REQ-13	Accessibility: Ensure the app is designed with accessibility features for users with diverse needs.
REQ-14	Backup and recovery: Implement a robust system for data backup and recovery to prevent data loss.
REQ-15	Legal compliance: Adhere to relevant data protection and financial regulations.
REQ-16	Integration with university systems: Collaborate with existing university databases for seamless data exchange.

Table 1: Informal List of Requirements for the University Payment App

F. Tools and Technologies

Backend Technologies

- **Express:** HTTP server for web applications.
- **Mongoose ODM:** Connects Express to MongoDB, simplifying MongoDB data interactions.
- **Zod:** TypeScript-first schema and validation library, ensuring input data conformity.

Frontend Technologies

- **React:** JavaScript library for building user interfaces.
- **Tailwind:** Utility-first CSS framework for styling.

Dependencies

- **cors:** Handles cross-origin resource sharing.
- **body-parser:** Middleware for parsing HTTP request bodies.
- **jwt:** Manages JSON Web Tokens for authentication.