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Unisync: Connect, Track, Save

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Abstract: *Online banking transaction systems are among the most complex, high-demand, and frequently updated application systems in modern software engineering. As the scope of online banking services expands, security concerns and operational efficiency become major challenges, especially in intelligent business sub-modules. Traditional online banking architectures often fail to meet the requirements of advanced security, real-time transaction processing, and adaptability to emerging financial threats.*

The proposed system introduces a new architecture designed to enhance security, improve efficiency, and support adaptive learning capabilities. The system can detect fraudulent activities in real time, optimize transaction processing, and provide personalized banking services based on user behaviour analysis.

Furthermore, this research explores the key features and technical challenges associated with implementing an intelligent online banking system. We discuss how machine learning models are trained to recognize anomalies, automate decision-making, and enhance the overall security framework. Additionally, the paper highlights the integration

Keywords: Online banking, Security, Fraud detection, Real-time monitoring

I. INTRODUCTION

- In today's rapidly evolving digital landscape, the demand for efficient, secure, and user-friendly banking applications is at an all-time high. With an increasing number of individuals and businesses looking to manage their finances online, a robust solution is needed to address the challenges of traditional banking, such as accessibility, user experience, and security. This project aims to build a modern banking application that leverages a cutting-edge tech stack to provide a seamless, reliable, and secure financial platform for users.
- This Application aims to develop a modern banking application that combines secure financial management with a seamless user experience. By leveraging technologies like Next.js, TypeScript, App write, Plaid, Dwolla, and Zod, the application will provide users with the ability to manage their finances, make secure payments, and access financial data with ease.
- The app will be built using Next.js for server-side rendering and performance optimization, TypeScript for type safety, and App write for backend services. Integrations with Plaid (for account linking and financial data) and Dwolla (for ACH payments) will enable smooth, real-time transaction capabilities.
- The application is designed to provide a seamless and responsive blogging experience with efficient user management and content moderation capabilities.

II. PROBLEM STATEMENT AND OBJECTIVES

- In today's digital economy, the demand for easy-to-use, secure, and feature-rich banking applications is increasing rapidly. However, existing banking applications often suffer from issues such as complex user interfaces, lack of seamless integration with third-party financial services, and limited access to modern financial technologies. Moreover, many applications still lack a unified platform to integrate financial data from different banks and services, creating friction for users trying to manage their finances.
- This project aims to solve these issues by building a robust, secure, and user-friendly banking application that integrates multiple financial services, including account linking, payments, transactions, and financial data aggregation. By leveraging modern technologies and third-party APIs such as Plaid, Dwolla, and App write,

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the application will provide a smooth and cohesive experience for users who want to manage their personal finances and make digital

Objectives of Project

The main objectives of this project are to:

- Create a user-friendly banking application using Next.js, TypeScript, and App write, focusing on performance and accessibility.
- Integrate financial APIs such as Plaid (for bank account linking and financial data aggregation) and Dwolla (for ACH payments) to facilitate seamless transactions and financial data management.
- Implement robust security features to ensure safe data handling and privacy, leveraging modern technologies like OAuth, JWT authentication, and data encryption.
- Provide a responsive, mobile-friendly UI/UX that allows users to easily access and manage their accounts, make transfers, view transaction history, and utilize other banking features.
- Ensure scalability and reliability, using a cloud-based back-end powered by App write, to handle high volumes of users and transactions without compromising performance.

III. LITERATURE REVIEW

Year	Author	Name	Description
2018	Sahed Sabab, Sadman Islam	eExpense: A smart Approach to track everyday expense	eExpense is application that runs on Android smartphones to store and calculate financial data. Also monitors user's income and monthly balance.
2020	Velmurugan A, Albert Mayan J	EXPENSE MANAGER APPLICATION	In this paper, we develop a mobile application developed for the android platform that keeps record of user personal expenses, his/her contribution in group expenditures, top investment options, view of the current stock market, read authenticated financial news and grab the best ongoing offers in the market in popular categories.
2020	Guangsheng Luo, Wenei Li, Yuzhong Peng	Overview of Intelligent online banking system	The exisiting online banking business sub-module is intelligent and facing major challenges in security. This article machine learning and online business module to implememnt business agent online banking system based on new architecture
2018	Anshu Premchand, Anurag Choudhary	Open banking &APIs for Transformation in Banking	Using APIs Banks can transform their core systems for innovations and can integrate with internal systems and external partners in a simpler manner
2022	Ersin Unsal, Bilgehan Oztekin, Murat cavus, Suat Ozdemir	Building a Fintech Ecosystem. Design and develop fintech API gateway	Sharing financial data on the conditions approved by user through electronic media is a secure fashion is basically called open banking. Third parties are provided financial data with the help of APIs.

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2022	Abhilash Katari, Madhu Ankam	Data Governance in Multi-Cloud Environments for Financial Services: Challenges and Solutions	This article delves into the specific challenges faced by financial services firms when managing data governance across multi-cloud environments. We explore issues such as the lack of standardized data governance frameworks, the complexities of data synchronization across different cloud platforms, and the heightened risk of data breaches
2024	Udit Patel	Data Privacy and Security in Financial Services	protecting information includes extensive practice and technological solutions meant to protect information and prevent its illegitimate access or alteration
2021	Ferdinando Giglio1	UPI based banking application	This article analyzes the Fintech evolution. After describing the process of this phenomenon, some of the main definitions are provided both nationally and internationally

IV. METHODOLOGY

Algorithm

Unisync leverages a client-server architecture based on Next.js for server-side rendering, which ensures fast load times and secure processing of financial data. Plaid API is used to securely link multiple bank accounts and pull real-time transaction data, while Dwolla is used to facilitate peer-to-peer fund transfers.

Algorithm: Real-time Financial Data Synchronization

Algorithm:

1. Initialization: Set up the necessary environment, libraries, and databases.

2. User Verification: It is done by using username and password when the user is already registered. If the user is new he has to provide all the required details including bank details

3. Interfaces: Provide an interface for users to access the transactions history and current transactions. Provide an interface to check and tally the amount in toll of all the bank accounts in various banks. Update the database of the application with the latest availability information.

4. Transactions: Provide a suitable system to make actual transactions through various banks Update the database of banks and keep banks updated with the latest transactions

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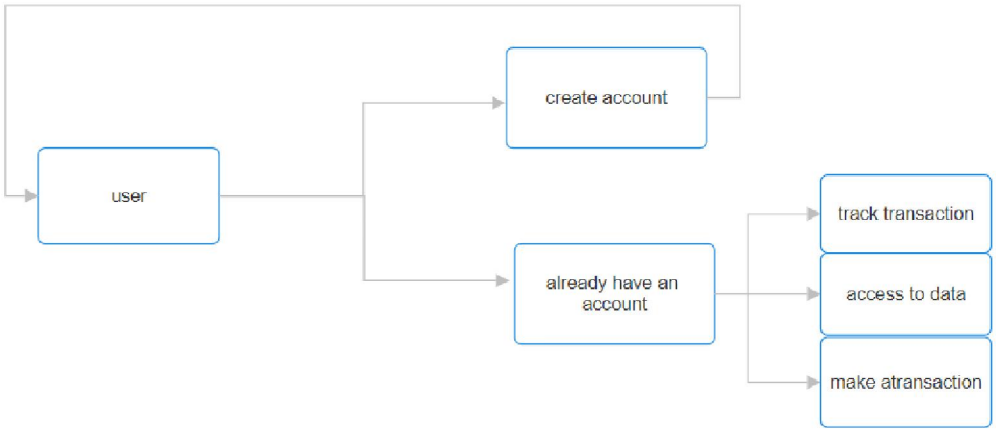
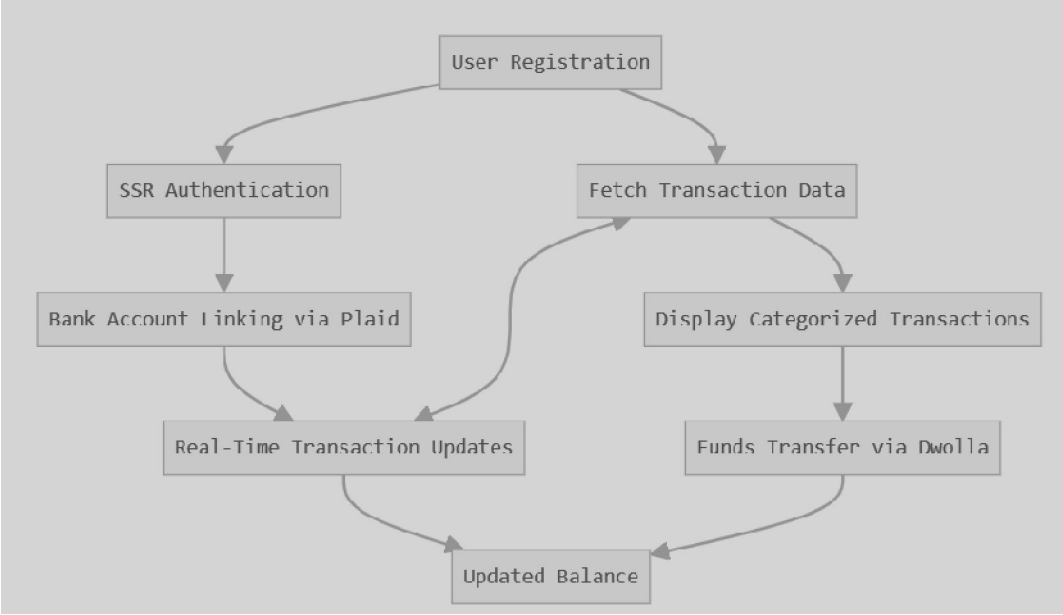
V. SYSTEM DESIGN



System Flowchart

- **User Authentication**: Appwrite manages authentication and secure data storage using token-based systems and encrypted databases.
- **Bank Connectivity**: Plaid API integrates with major Indian banks to pull real-time account and transaction data.
- **Fund Transfers**: Dwolla handles the fund transfer process within the platform, allowing users to send money to other Unisync users without leaving the app.



Flowchart

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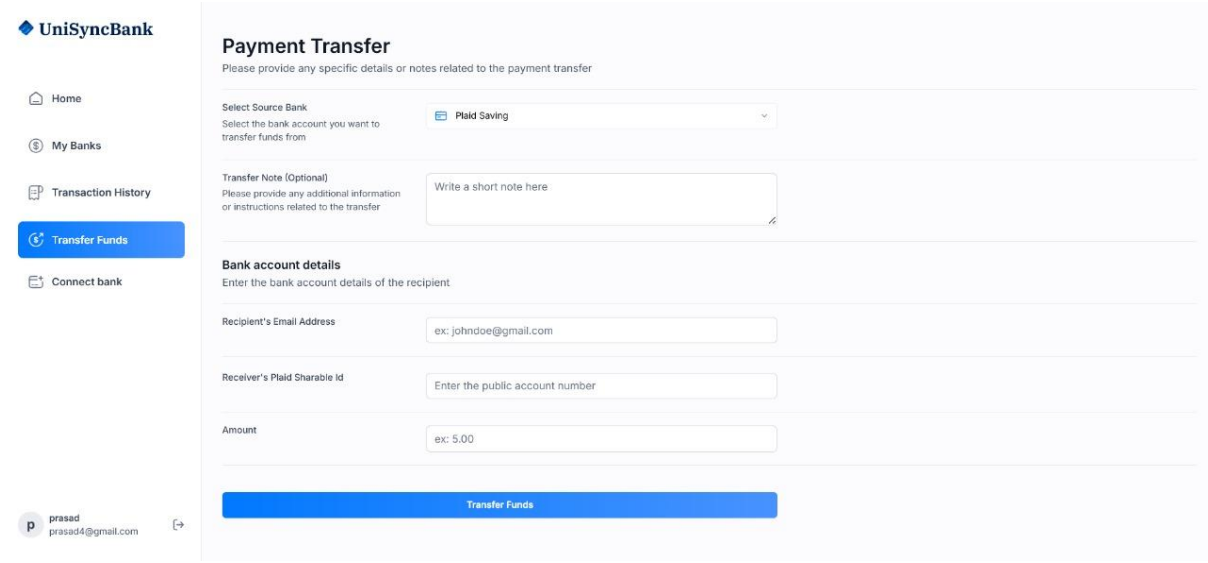
Proposed system

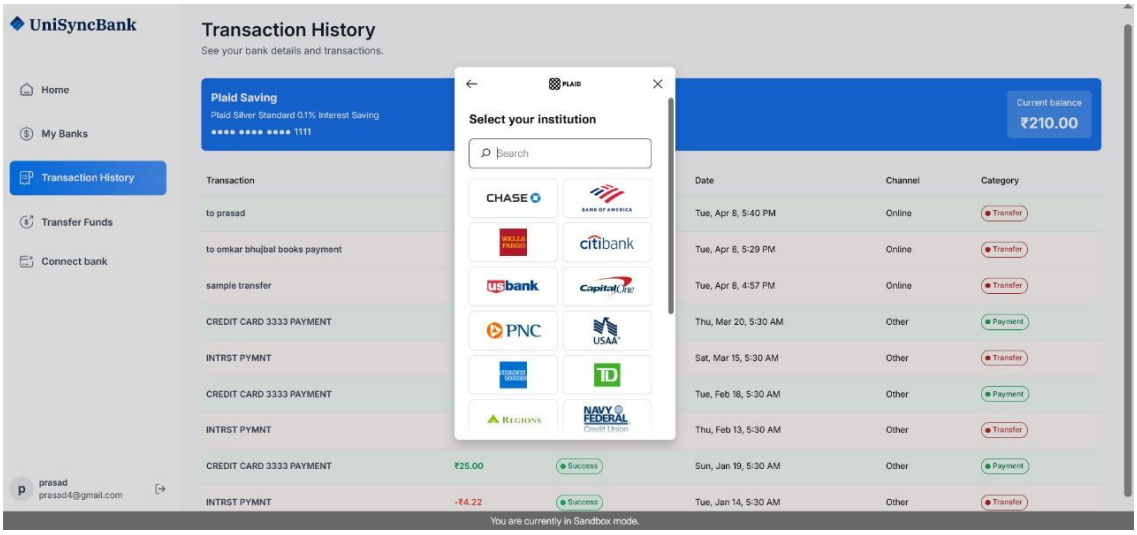
The methodology focuses on three main aspects of the Unisync platform:

- **User Authentication:** Users sign up and authenticate via Appwrite, ensuring a secure connection.
- **Bank Account Integration:** Plaid is used to securely link bank accounts, retrieve transaction data, and display balances and expenses. The data is updated in real time, giving users instant insights into their financial activity.
- **Peer-to-Peer Transfers:** Dwolla allows secure, internal money transfers between Unisync users, with funds deducted from the sender's bank account and credited to the recipients.

VI. RESULTS



Payment Transfer



Connecting bank account

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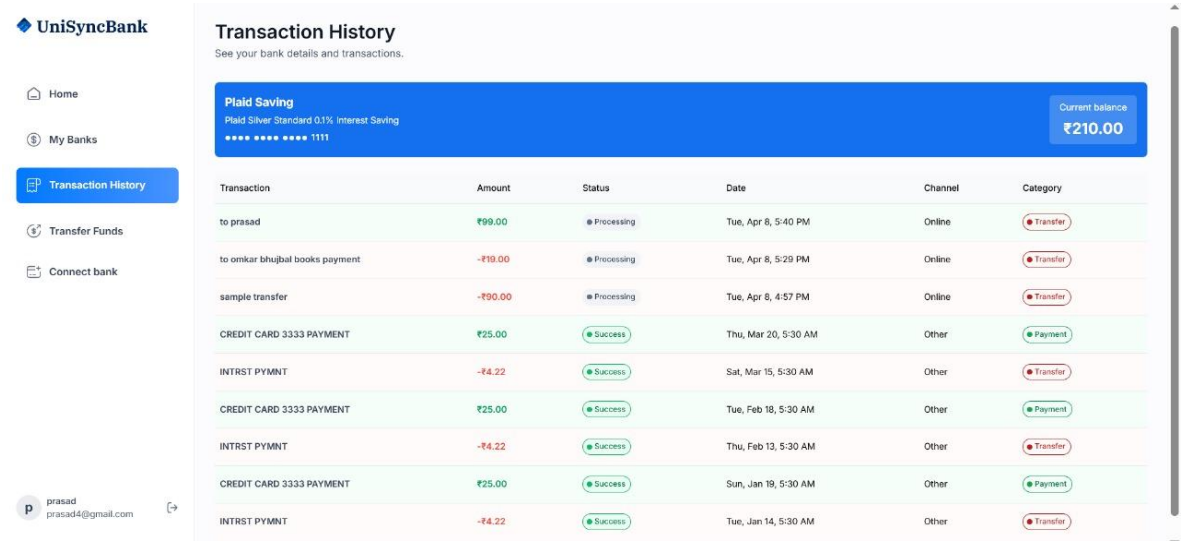

Transaction history page

VII. CONCLUSION AND FUTURE WORK

This project presents a modern, secure, and feature-rich banking application designed to simplify financial management for users. By integrating advanced technologies such as Next.js, TypeScript, Appwrite, Plaid, Dwolla, and Zod, the application ensures a seamless, secure, and scalable platform for banking and digital transactions. The system effectively addresses the limitations of traditional banking apps, such as complex interfaces, lack of integration with third-party financial services, and security concerns.

With the incorporation of bank account linking, transaction management, secure payments, and data validation, the application enhances both user convenience and financial transparency. Future enhancements, including UPIintegration, AI-driven financial insights, multi-currency support, and blockchain-based security, will further strengthen its capabilities and adaptability in an evolving digital economy.

By focusing on performance, security, and usability, this banking application not only meets the current demands of digital finance but also sets a foundation for future advancements. Its potential to bridge traditional banking with modern financial technology ensures that users will benefit from a fast, secure, and intuitive banking experience. This project lays the groundwork for **a** next-generation financial ecosystem, making banking more accessible, efficient, and secure for individuals and businesses alike.

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