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Data Science

VyomNext – The Next-Gen Banking

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Project Guide

Ms. Poonam Pangarkar.

Outline

- Introduction
- Literature Survey of the existing systems
- Limitations of the existing systems
- Problem statement
- System Design
- Technologies and methodologies
- Implementation
- Conclusion
- References

Introduction

- The digital revolution has transformed the way we live, shop, and communicate — and banking is no exception.
  Yet, despite so many apps and platforms, managing money today often feels scattered and inefficient.
- Separate apps for banking, payments, services, and document storage.
- Delays in finding the right service at the right time.
- Confusion caused by switching between multiple platforms.
- This fragmentation not only wastes time but also creates frustration for users.

Solution Proposed:

VyomNext is our proposed solution – a unified digital banking and financial management platform that brings everything under one roof:

Banking, Loan Recommendation, Payments, Services, Profile, and Digilocker – all seamlessly integrated with the power of AI.

Our goal is simple, to make financial management as easy, efficient, and smart as possible.

Introduction

Observations:

• People frequently use mobile apps for banking, yet:

- Transactions are available, but advanced tools are missing.
- EMI calculators require third-party apps or websites.
- DigiLocker exists separately, not integrated with banking apps.
- Customer support is slow and not well-connected with user accounts.

• These gaps highlight the need for an all-in-one platform.

Motivation:

- Observations of users struggling with multiple apps for basic banking needs.
- Increasing demand for fast, reliable, and integrated financial services.
- The growing need for secure document storage within banking systems.
- Personal motivation: To create a modern solution that simplifies daily financial operations for all users

Introduction

Objectives:

- Allow users to raise video-based service tickets by converting video to audio, extracting text via Google Speech-to-Text, and classifying queries using NLP models (OpenAI-Whisper) for department routing.

- Allow users to submit complaints by typing queries, recording videos, or uploading audio files, which are automatically processed and converted into service tickets

- Provide personalized loan recommendations using the Gemini API based on user financial profiles.

- Enable users to view and manage all Aadhaar-linked bank accounts in one unified platform, offering a consolidated financial overview.

Literature Survey of the existing system

Sr. No.	Title	Author(s)	Year	Outcomes	Methodology	Result
1.	Research on loan approval and credit risk based on the comparison of Machine learning models[1]	Chunyu Yang	2024	This research paper concludes that logistic regression is the most practical model for loan approval and credit risk, as it balances with interpretability. While advanced models like random forests and neural networks achieve similar accuracy, their lack of transparency makes them less suitable for real-world banking use	The methodology involves applying six ML models on a home loan dataset, evaluated them with accuracy and confusion matrices, and compared their predictive performance with a focus on both accuracy and interpretability.	The results showed that logistic regression outperformed other models by providing the best balance between accuracy and interpretability
2.	Ticket automation: An insight into current research with applications to multi-level classification scenarios[2]	Alessandro Z., Matteo M., Michele S.	2023	The objectives of this paper are to look at the ticket classification problem in real-world support/bug-reporting datasets with a two-level label hierarchy (topics + subtopics)	The methodology involves using BERT-based text embeddings and incorporating hierarchical label information to classify tickets in multi-level categories. Comparing models to evaluate performance with accuracy and F1 score.	Using BERT with hierarchical labels significantly improved ticket classification, boosting F1-score and accuracy by up to 28% over baseline models.

Literature Survey of the existing system

Sr No.	Title	Author(s)	Year	Outcomes	Methodology	Result
3.	Banking Chatbots: How Artificial Intelligence Helps the Banks[3]	Ionuț-Alexandru, Denis-Alexandru, Răzvan Daniel ZOTA	2023	The paper concludes that AI chatbots in banking enhance customer service, enable 24/7 transactions, improve security through fraud detection, and increase operational efficiency, leading to better overall customer experience.	The study examined banking chatbots by analyzing how they leverage natural language processing, speech recognition, and machine learning to automate customer interactions. It focused on how these technologies enable chatbots to handle queries, perform transactions, provide personalized responses, and detect potential fraud, while also evaluating real-world deployment strategies and system architectures.	The study found that AI chatbots significantly improve banking operations by enabling 24/7 customer support, automating transactions, detecting fraud, and reducing workload on human agents, ultimately enhancing efficiency, security, and customer satisfaction.

Limitations of existing systems

- Fragmentation: Users need 4–5 apps for daily financial tasks.
- Inconvenience: Multiple logins, poor cross-platform interoperability.
- Limited functionality: EMI calculators and financial tools are often external websites, not part of apps.
- Security inconsistency: Each app has different security standards.
- User feedback: Strong demand for “one-stop” solutions.

Problem statement

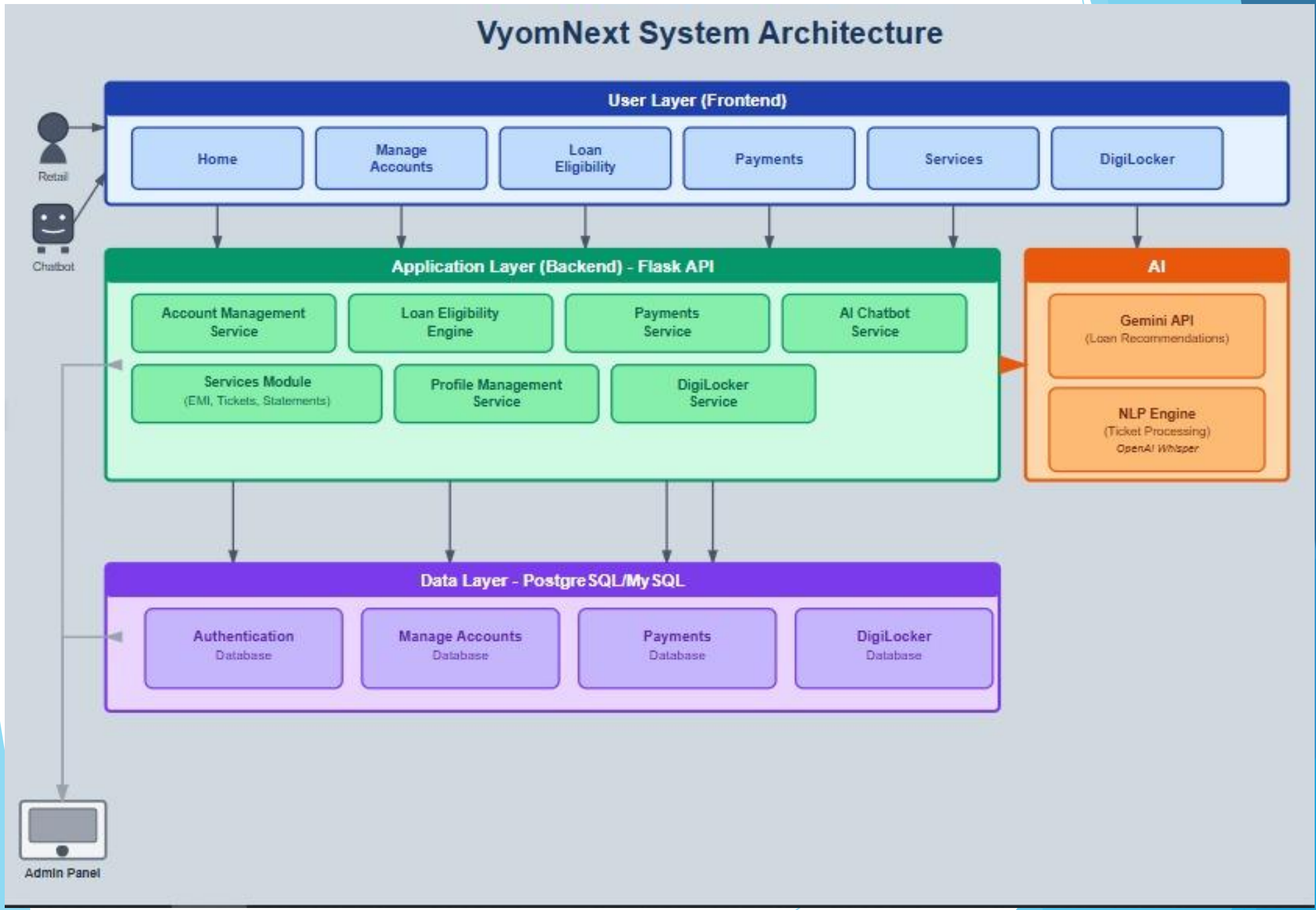
The problem is the lack of a unified, secure, and efficient platform that integrates banking, services, EMI management, and document storage.

Statement:
“To design and develop a unified digital banking and service management platform that consolidates essential financial and utility services into a single, scalable solution, ensuring reliability, security, and ease of access.”

Proposed Solution Features:

- Multi-bank fund transfers.
- Query Generation using Video/Audio/Text.
- EMI calculation tool.
- DigiLocker for documents & passes.
- Chatbot Interface for Account Management and Transactions

System Design



Technologies

- **API Integrations :** Gemini Flash , Brevo (OTP authentication)
- **Models :** OpenAI – Whisper-small (Speech to text)
- **Machine Learning :** XGBoost
- **Summary :** Natural Language Processing (NLP)
- **Frontend Development :**
  1. HTML
  2. CSS
  3. JavaScript
- **Backend Development :**
  1. Flask
  2. MySQL
  3. Postgre

Methodologies

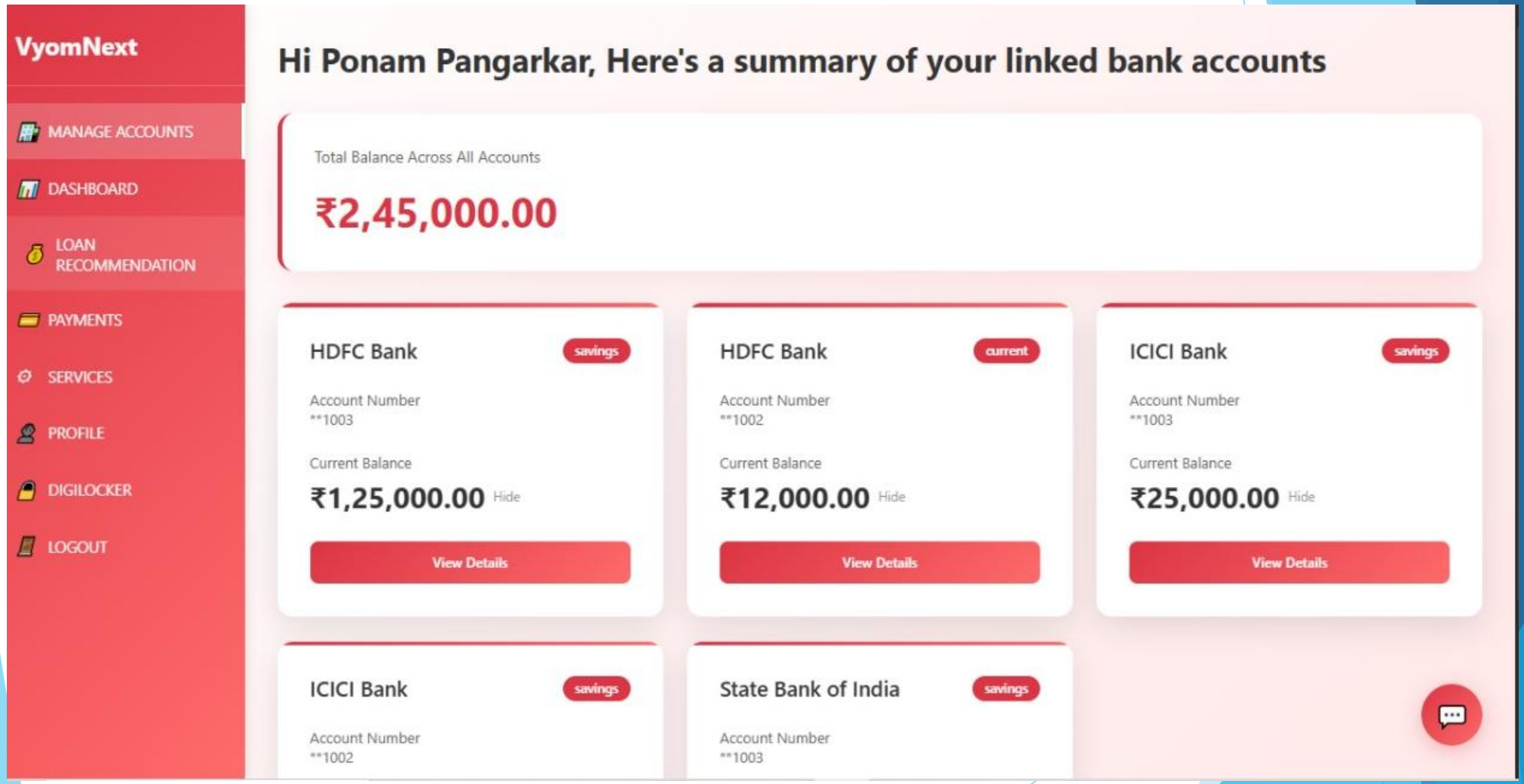
- **Data Collection :** Collect user information, Aadhaar details, transaction history. Integrate with mock APIs from HDFC, SBI, and ICICI banks for account and transaction data.

- **Feature Engineering:** Extract embeddings for text, audio, and video queries for similarity matching.

- **Algorithm Selection:**
  1. Loan Recommendation: Hybrid recommender (Content + Collaborative Filtering).

- **Deployment and Integration:**
  1. Backend APIs hosted on Flask.
  2. Database on PostgreSQL and MySQL.
  3. Frontend integration with HTML, CSS, JS

Implementation



Conclusion

- VyomNext solves the problem of fragmented digital services by integrating banking, payments, services, EMI calculators, and DigiLocker into one system.
- Offers efficiency, convenience, and security to modern users.
- Unlike traditional systems, VyomNext is scalable and adaptable for future needs.

➢ **Future Scope**:

- Add advanced financial analytics.
- AI-powered recommendations for savings and investments.
- Expand to insurance and healthcare service integrations.

References

[1] Chunyu Yang. "**Research on loan approval and credit risk based on the comparison of Machine learning models.**" ResearchGate (2024). https://www.researchgate.net/publication/377467455_Research_on_loan_approval_and_credit_risk_based_on_the_comparison_of_Machine_learning_models

[2] Alessandro Z., Matteo M., Michele S. "**Ticket automation: An insight into current research with applications to multi-level classification scenarios.**" ScienceDirect (2023).

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[3] Ionuț-Alexandru, Denis-Alexandru, Răzvan Daniel ZOTA. "**Banking Chatbots: How Artificial Intelligence Helps the Banks.**" ResearchGate (2023).

https://www.researchgate.net/publication/372443255_Banking_Chatbots_How_Artificial_Intelligence_Helps_the_Banks

Thank You...!!