

VAULTX

Akash Rajendran*, Christo V Rajesh[#], Harikrishnan P T^{\$}, Jebin Joseph[@], Sam Sebastian S⁺, Tinimol Andrews[&]

Department of CSE, College of Engineering Kidangoor, Kottayam, Kerala, India

*akashrajendran835@gmail.com, [#]christorajesh0@gmail.com, ^{\$}harikrishnan135790@gmail.com,

[@]jebinjoseph8421@gmail.com, ⁺samsebastian916@gmail.com, [&]tinimolandrews@gmail.com

Abstract—Managing important financial documents such as bills, warranties, and insurance policies has become increasingly challenging due to the growing volume of digital communications across multiple platforms like SMS, emails, and scanned receipts. Manual tracking of expiry dates, renewal schedules, and payment deadlines often leads to missed reminders and inefficient document organization. This paper presents VAULTX, an AI-powered secure mobile application designed to automatically extract, organize, and manage financial documents from multiple data sources using Optical Character Recognition (OCR) and Natural Language Processing (NLP) techniques. The system identifies key information such as expiry dates, policy details, warranty duration, and payment schedules, and provides intelligent reminders to prevent missed deadlines. It also generates policy health scores and recommends suitable insurance or warranty plans based on extracted data insights. All documents are securely stored using encrypted cloud storage to ensure privacy and accessibility. By integrating automated extraction, predictive analytics, and secure document management within a unified dashboard interface, VAULTX enhances efficiency, reduces manual effort, and improves financial document tracking for users.

Index Terms— Artificial Intelligence, Optical Character Recognition (OCR), Natural Language Processing (NLP), Financial Document Management, Warranty and Insurance Tracking, Secure Cloud Storage, Smart Reminder System.

I. INTRODUCTION

The rapid growth of digital communication platforms has significantly increased the number of financial documents received by users through SMS, emails, and receipts. These documents include warranty certificates, insurance policies, invoices, and payment confirmations that require careful tracking and timely renewal. Managing such documents manually is difficult and often results in missed expiry dates, delayed renewals, and inefficient organization of important records.

Existing financial management applications primarily focus on expense tracking and bill payment reminders but lack the capability to manage warranty and insurance-related documents effectively. Many systems also fail to extract information from multiple sources such as Gmail and receipt images, limiting their usefulness for comprehensive financial document organization.

To address these limitations, this paper proposes VAULTX, an AI-powered secure organizer designed to automatically collect, extract, classify, and manage financial documents from SMS, emails, and receipts within a single platform. The system uses Optical Character Recognition (OCR) and Natural Language Processing (NLP) techniques to identify important

information such as expiry dates, renewal schedules, product details, and policy information. Based on this extracted data, the system generates smart reminders and notifications to help users avoid missing important deadlines.

In addition to automated extraction and reminders, VAULTX provides advanced features such as encrypted document storage, dashboard-based analytics, policy health score generation, and intelligent policy recommendation support. These capabilities improve accessibility, enhance document security, and assist users in making better financial decisions.

Thus, VAULTX offers an integrated and intelligent solution for managing financial documents efficiently while ensuring privacy, automation, and ease of use through a unified mobile application platform.

II. LITERATURE SURVEY

Recent research has explored the application of Artificial Intelligence (AI), Optical Character Recognition (OCR), and Natural Language Processing (NLP) techniques for automating document processing, financial tracking, and secure data management systems.

The study “Predictive Modelling and AI Integration for Enhanced Analysis of Warranty and Notification Data” [1] presents the use of logistic regression and time-series analysis to identify warranty claim patterns and forecast future trends. The system demonstrated how predictive analytics can support better decision-making in warranty management environments.

The work “Artificial Intelligence as Assistance in Warranty Claim Handling” [2] introduced an association rule learning approach to recommend related spare parts during warranty claim processing. The study highlighted the effectiveness of AI in improving workflow efficiency and reducing manual effort in claim handling operations.

The report “AI for Better Insurance: Enhancing Customer Outcomes amid Industry Challenges” [3] discussed how machine learning, NLP, and OCR technologies improve claims processing, fraud detection, underwriting, and compliance monitoring in insurance systems. The study also emphasized the importance of transparency and governance in AI-based financial applications.

An integrated Intelligent Document Management System proposed in [4] used a hybrid combination of computer vision-based OCR and NLP techniques to extract structured information from invoices and identity documents. The system demonstrated improved accuracy compared to traditional extraction methods.

The deep learning-based document classification framework presented in [5] evaluated convolutional neural networks and transformer-based architectures such as MobileNetV2 and LayoutLMv3 for financial document classification and extraction. The results showed significant improvements in classification accuracy and extraction performance.

The study “Automating Information Extraction from Textual Documents Using NLP Techniques” [6] reviewed modern NLP approaches such as Named Entity Recognition and dependency parsing for extracting structured information from unstructured text. These techniques support efficient indexing and categorization in document management systems.

The application BillBuddy proposed in [7] introduced an AI-powered receipt capture and expense tracking system that uses OCR to extract financial data and generate payment reminders. The system improved transparency in expense management but lacked long-term document storage and warranty tracking features.

The encryption framework proposed in [8] introduced an end-to-end secure cloud storage mechanism that protects user data from unauthorized access while maintaining system usability and portability across devices.

The deep learning-based OCR engine presented in [9] addressed challenges in receipt digitization such as noise, layout variation, and image distortion, improving extraction accuracy in real-world financial document scenarios.

Finally, the study on privacy and ethical considerations in AI-powered finance [10] emphasized the importance of secure storage, transparency, fairness, and compliance when handling sensitive financial data.

Overall, these studies demonstrate that although significant progress has been made in document extraction, predictive analytics, and secure storage techniques, there remains a need for a unified system that integrates automated multi-source document extraction, intelligent reminders, predictive insights, and secure financial document organization within a single platform. The proposed VAULTX system addresses these limitations by combining AI-based extraction, expiry prediction, encrypted storage, and smart reminder generation into one integrated mobile application.

III. METHODOLOGY

The methodology of the proposed VAULTX system is designed to provide an intelligent and secure platform for organizing financial documents such as bills, warranties, and insurance policies. The architecture integrates Artificial Intelligence techniques, Optical Character Recognition (OCR), Natural Language Processing (NLP), secure cloud storage, and notification services within a unified mobile-based application. The proposed system consists of five major modules: AI Extraction Module, Best Policy Module, Notification Module, Dashboard Module, and Database Module. The architecture of the proposed system is illustrated in Fig. 1.

1. AI Extraction Module:

- Acts as the core component of the proposed system.
- Extracts financial document information from multiple sources such as:
 - SMS messages
 - Gmail
 - Scanned receipts
- Uses OCR techniques to extract text from uploaded documents.
- Applies NLP techniques to identify important entities such as:
 - Expiry dates
 - Warranty duration
 - Policy details
 - Product information
 - Payment-related data
- Converts unstructured document content into structured digital records.
- Automatically categorizes extracted documents into warranties, insurance policies, and bills.
- Reduces manual effort and improves extraction accuracy.

2. Best Policy Module:

- Responsible for analyzing warranty and insurance-related information extracted from documents.
- Generates a policy health score based on financial and policy parameters.
- Suggests suitable warranty and insurance policy improvements.
- Helps users evaluate existing policies effectively.
- Supports better decision-making while selecting appropriate policies.
- Enhances financial planning through intelligent recommendation support.

3. Notification Module:

- Monitors expiry dates, renewal schedules, and payment deadlines continuously.
- Generates automated alerts and reminders for:
 - Warranty expiry
 - Insurance renewal
 - Bill payment deadlines
- Sends notifications through mobile application alerts and email reminders.
- Helps users avoid missed renewals and financial risks.
- Improves reliability of document tracking through proactive reminder generation.

4. Dashboard Module:

- Provides a centralized interface for viewing extracted document information.
- Displays categorized summaries of:
 - Bills
 - Warranties
 - Insurance policies

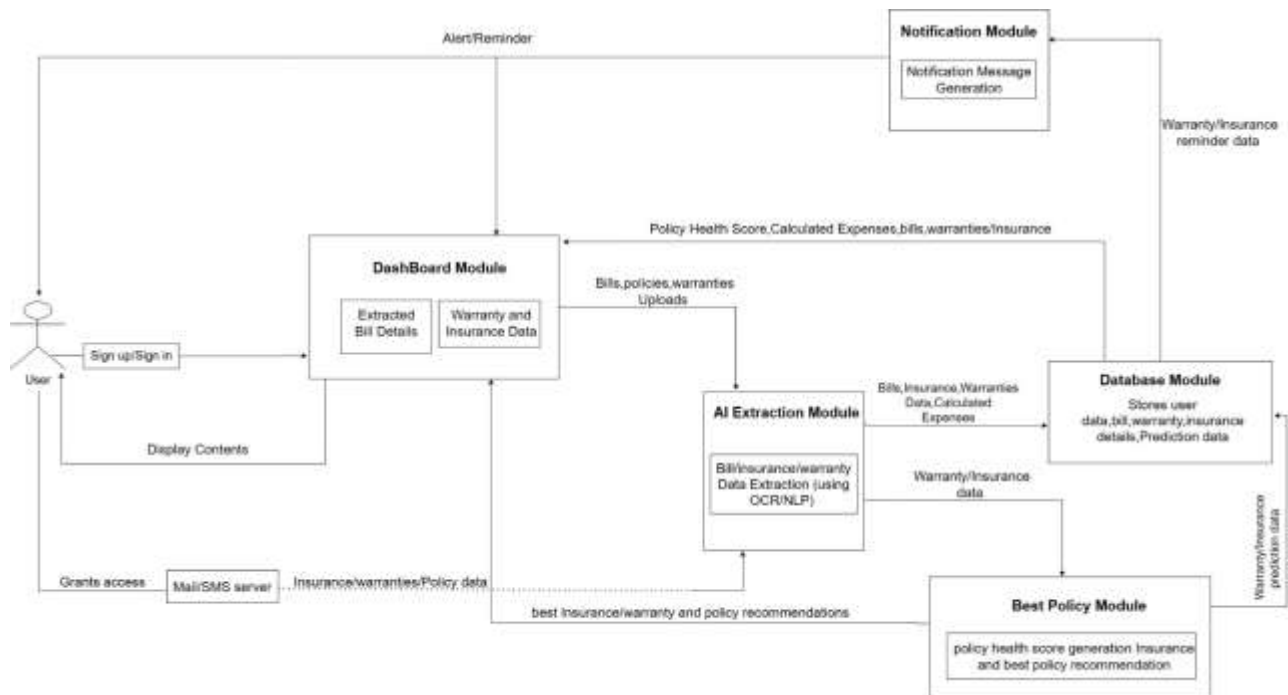


Fig. 1. System Architecture

- Presents statistical insights and visual summaries for better understanding.
- Enables quick access to stored documents and extracted details.
- Improves user interaction through a structured and user-friendly interface.

5. Database Module:

- Stores extracted financial document information securely using cloud storage.
- Maintains structured records of:
 - Warranty details
 - Insurance policies
 - Bills and receipts
 - Reminder schedules
- Uses encryption techniques to protect sensitive financial data.
- Supports secure backup and fast retrieval of stored information.
- Ensures synchronization between system modules and dashboard interface.

IV. RESULTS AND DISCUSSION

The proposed VAULTX system demonstrated effective performance in organizing and managing financial documents collected from multiple sources such as SMS messages, Gmail, and scanned receipts. The integration of Artificial Intelligence techniques with Optical Character Recognition (OCR) and

Natural Language Processing (NLP) enabled accurate extraction of important information including expiry dates, warranty duration, policy details, and payment-related data.

The AI Extraction Module successfully converted unstructured document content into structured digital records, improving document accessibility and reducing manual effort required for tracking financial information. The system automatically categorized documents into warranties, insurance policies, and bills, allowing users to view relevant information through a centralized dashboard interface.

The Best Policy Module generated policy health scores based on extracted insurance and warranty data, helping users evaluate the effectiveness of their existing policies. This feature provided useful insights that support better financial planning and decision-making while selecting appropriate insurance or warranty options.

The Notification Module effectively monitored renewal schedules and expiry dates, generating automated reminders for upcoming deadlines. These proactive alerts helped users avoid missed payments and policy expirations, improving the reliability of financial document management.

The Dashboard Module provided a structured visualization of stored documents and extracted information through summarized statistics and categorized views. This improved usability by allowing users to quickly access warranty details, insurance coverage information, and payment records in a single interface.

The Database Module ensured secure storage of sensitive financial documents using encrypted cloud storage. The system supported reliable data synchronization, fast retrieval, and secure backup mechanisms, enhancing overall system perfor-

mance and data protection.

Overall, the integration of AI-based extraction techniques, intelligent notification services, and secure cloud storage within a unified mobile platform significantly improved the efficiency and usability of financial document management. However, the system performance depends on the accuracy of OCR extraction and availability of network connectivity for cloud synchronization. Future improvements may include enhanced multilingual support, improved extraction accuracy for low-quality receipt images, and integration with additional financial service platforms for extended functionality.

V. CONCLUSIONS

In conclusion, the proposed VAULTX system provides an effective solution for managing financial documents such as bills, warranties, and insurance policies through a unified mobile application platform. By integrating Artificial Intelligence techniques with Optical Character Recognition (OCR) and Natural Language Processing (NLP), the system automatically extracts important information from SMS messages, Gmail, and scanned receipts, helping users track expiry dates, renewal schedules, and payment-related details efficiently. The system also generates policy health scores and provides smart reminders for upcoming deadlines, reducing manual effort and improving financial document organization. Secure cloud-based storage ensures safe access and protection of sensitive user data while supporting easy retrieval through a centralized dashboard interface.

Overall, this integrated approach improves usability and helps users manage important financial documents more effectively. In the future, the system can be enhanced by improving extraction accuracy, supporting multilingual document processing, and integrating additional financial service platforms such as banking and payment gateways to provide more advanced financial management capabilities.

REFERENCES

- [1] S. Ojala, "Predictive modelling and ai integration for enhanced analysis of warranty and notification data," *Master's Thesis, School of Technology and Innovation*, 2024.
- [2] S. Kvist, "Artificial intelligence as assistance in warranty claim handling," *IEEE*, 2023.
- [3] B. et al., "Ai for better insurance: Enhancing customer outcomes amid industry challenges," *CSIRO Report*, 2025.
- [4] M. Pandey, M. Arora, and S. Arora, "Ai-based integrated intelligent document management system," *IEEE*, 2023.
- [5] V.-A. Serbanescu and M. Dhali, "Deep learning for effective classification and information extraction of financial documents," *Elsevier*, 2025.
- [6] J. Somaya and E. H. Elalaoui, "Automating information extraction from textual documents using nlp techniques," *International Conference on Advances in Communication Technology and Computer Engineering*, 2024.
- [7] N. A. Suhaimi and N. A. M. Ariff, "Billbuddy: Ai-powered receipt capture and smart bill sharing for expense management," *IEEE*, 2025.
- [8] L. Chen and Y.-N. Li, "End-to-same-end encryption for secure cloud-based data storage," *ACM Transactions on Privacy and Security*, 2025.
- [9] H. Rahman and M. T. Chowdhury, "Deep learning-based ocr engine for printed receipt images," *IEEE*, 2023.
- [10] S. Brightwood and H. Jame, "Data privacy security and ethical considerations in ai-powered finance," *IEEE*, 2024.