Project Title: Welth- AI-Powered Finance Management Platform

1. Introduction

Innovation within ICT projects arises when established technologies are reimagined to address persistent challenges in novel ways. Financial management is one such challenge—individuals and small businesses often struggle to track expenses, identify spending patterns, and plan budgets. Conventional apps offer static solutions, but they fall short in adaptability and intelligence.

Our project, **Welth: AI-Powered Finance Management Platform**, introduces originality by integrating **Artificial Intelligence (AI), Machine Learning (ML), and Optical Character Recognition (OCR)** into a seamless, end-to-end financial assistant. Instead of depending on users to manually log transactions, our system automates receipt scanning, categorisation, and notification generation. This approach reduces human error, saves time, and provides actionable insights.

The novelty lies in combining **computer vision, supervised learning, and pattern recognition** within the context of day-to-day financial tracking. This unique blend not only differentiates our system from existing expense trackers but also contributes significantly to the **FinTech domain of ICT engineering**.

2. Novel Approach

The innovative aspects of our system can be summarised as follows:

1. Intelligent Receipt Scanning (OCR + AI)

- Unlike existing solutions that rely on simple OCR, our approach integrates **AI-powered error correction** to handle noisy, blurred, or misaligned receipts.
- Example: If OCR misreads "₹500.00" as "₹5OO.OO", the ML model corrects the value based on contextual financial data.
- This innovation significantly boosts accuracy, particularly for Indian retail receipts where fonts, languages, and layouts vary.

2. Adaptive Machine Learning for Categorisation

	Marwadi University
![Marwadi University Logo]	**Marwadi University**
	Faculty of Technology
	Department of Information and Communication Technology
Subject:Capstone Project	Innovation and Originality
	Date: 21.09.25 | Enrolment No:92200133041 & 92200133043

- Instead of using **rule-based systems** (e.g., if description contains "Uber" → Transport), we employ a supervised ML model trained on historical transaction data.
- Over time, the system **learns user behaviour**. For instance, if a user often buys snacks at a bookstore, the system adapts and categorises those expenses correctly under "Food" rather than "Education."
- This **context-awareness** is what sets the project apart from generic finance tools.
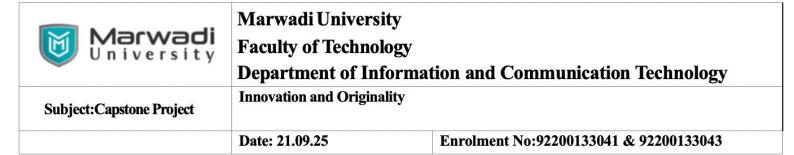
3. Automated Recurring Transaction Detection

- Recurring payments (e.g., subscriptions, rent, EMIs) are often missed by rule-based trackers.
- Our system applies **pattern recognition and sequence analysis** to identify such recurring events in historical transaction data.
- Once detected, the system automatically generates **advanced alerts** to the user, ensuring they are prepared for upcoming payments.

4. Unified ICT System Design

- The integration of **React.js (front-end), Node.js/Express (back-end), MongoDB (database), and Python AI/ML modules** creates a hybrid design.
- Unlike siloed apps that handle one task, our platform brings together **data ingestion, processing, storage, and real-time visualisation** in one ecosystem.
- This design is scalable for personal, professional, and even small business financial management.

6.3 Comparison with Existing Solutions

To establish originality, we evaluated our system against well-known personal finance apps such as **Walnut, Money Manager, and Mint**.

	Marwadi University
	Marwadi University
	Faculty of Technology
	Department of Information and Communication Technology
Subject:Capstone Project	Innovation and Originality
	Date: 21.09.25 Enrolment No:92200133041 & 92200133043

Feature	Existing Solutions	Our Solution (Welth)
Receipt Handling	OCR only (limited accuracy, language-dependent)	AI-enhanced OCR with error correction and adaptability
Categorization	Static rules, limited flexibility	ML-based, learns dynamically from user history
Recurring Detection	Basic reminders (manual input required)	Automated pattern recognition of recurring transactions
User Adaptability	One-size-fits-all	Contextual, learns individual financial behavior
Target Users	Mostly salaried professionals	Students, small businesses, and professionals
Technological Contribution	Expense tracker	AI-driven, context-aware financial assistant

This comparison demonstrates how our originality lies not only in technology but also in **practical application and adaptability to diverse user groups**.

6.4 Contribution to the ICT Field

The project contributes to ICT in the following ways:

1. Advancement of AI in FinTech

By embedding **AI/ML into financial data workflows**, we bridge the gap between computer vision research and financial technology. Our solution demonstrates how AI can **minimise manual inputs, improve accuracy, and generate insights** in real-world applications.

2. Democratisation of Intelligent Finance Tools

	Marwadi University
	Marwadi University
	Faculty of Technology
	Department of Information and Communication Technology
Subject:Capstone Project	Innovation and Originality
	Date: 21.09.25 Enrolment No:92200133041 & 92200133043

Most AI-powered finance tools are either costly or enterprise-focused. Our project makes these technologies accessible to:

- **Students:** Helping them manage limited budgets and allowances.
- **Small businesses:** Offering automated bookkeeping without needing expensive ERP systems.
- **Professionals:** Reducing the time spent on manual tracking.

3. Research Opportunities

Our system creates pathways for future ICT research:

- **Federated Learning in Finance** → Preserve user privacy while training models on collective financial data.
- **Regional OCR** → Develop OCR pipelines for multilingual receipts across India (Hindi, Gujarati, Tamil, etc.).
- **Predictive Analytics** → Extend current models to forecast spending trends and suggest personalised saving strategies.

4. Addressing ICT Gaps

Existing literature (e.g., IEEE and ACM publications on OCR and ML in finance) often highlights the **accuracy gap in OCR-based categorisation** and the **lack of personalisation** in expense trackers. Our project directly addresses these challenges by:

- Building **error-correcting OCR pipelines**.
- Implementing **adaptive categorisation models** that evolve with user data.

6.5 Conclusion

The originality of **Welth** lies in its **fusion of AI/ML with financial management**, turning a traditionally manual process into an intelligent, automated, and adaptive system. While existing apps stop at tracking, our platform actively **learns, predicts, and notifies**, making it a **true financial assistant**.

From an ICT perspective, this project contributes to the **FinTech domain by operationalising AI/ML in a cost-effective, user-centric manner**. Its innovations in OCR enhancement, adaptive categorisation, and intelligent recurring detection set a foundation for future research and commercial applications.

Thus, the project is not just a technical achievement but a **novel step forward in AI-driven automation within ICT**, addressing an unsolved challenge and opening doors to broader adoption of AI in everyday financial management.