Financial Tracking, Analysis and Visualization for Small Businesses

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Abstract. Small and micro businesses often work with very limited money and time. Many owners still track sales, expenses, rent, and taxes on paper or in messy spreadsheets, making it hard to plan or spot problems early. This project creates a simple, smart tool that lets businesses upload their records and quickly see clear insights about profits, losses, spending, rent, taxes, and cash flow. It uses basic machine learning models like classification, SVM, and linear regression for forecasting and finding unusual patterns, along with easy dashboards that show visuals and short explanations. This tool helps small businesses understand their finances, manage inventory better, and identify which expenses affect profits most. The focus is on making the system simple, expandable, and helpful for non-technical users.

Keywords: Small Businesses · Financial Tracking · Machine Learning · Visualization · Forecasting

1 INTRODUCTION

Small businesses like retail stores struggle to manage their finances properly. They rely on manual records and spreadsheets to store their transactions and track their expenses such as profit, loss and other parameters. This process can become a burden for small businesses. Although many AI tools are already available in the market for these tasks, they are often very expensive and complex for small businesses to understand and manage.

Our aim is to create a tool that can analyze the data and present the analysis visually using charts and graphs so that business owners can easily identify profit, loss, and inventory patterns. This paper also focuses on Customer Lifetime Value (CLV) analysis to help small businesses make smarter data-driven decisions.

The literature survey in the next section outlines research papers in similar fields, their methodologies, and their limitations.

R. Vasanth Kumar Mehta et al. (eds.), *Proceedings of the International Conference on Intelligent Systems for a Sustainable Future (ISSF 2026)*, Atlantis Highlights in Intelligent Systems 16,
https://doi.org/10.2991/978-94-6239-693-7_93

2 LITERATURE SURVEY

Title	Year	Author	Methodology / Contribution
Data-to-Dashboard: Multi-Agent LLM Framework for Insightful Visualization	2025	Ran Zhang & Mohannad Elhamod	Multi-agent LLM pipeline that automatically converts raw data into dashboards and financial insights.
BizChat: Scaffolding AI-Powered Business Planning for Small Business Owners	2025	Q. R. Lauro, A. Gautam, Y. Kotturi	AI system helping small business owners plan workflows and make decisions based on their digital literacy level.
A Systematic Review of Explainable AI in Finance	2025	Multiple Authors	Survey of explainable AI methods in finance focusing on transparency and model interpretability.
Data Visualization for Improving Financial Literacy	2025	Meng Du et al.	Study showing how visualization tools help users better understand financial indicators.
Graph Dimension Attention Networks for Enterprise Credit Assessment	2024	Multiple Authors	Uses graph neural networks and attention mechanisms for enterprise credit prediction.
A High-Performance Turnkey System for Customer Lifetime Value Prediction	2024	Y. Yan et al.	Automated CLV prediction platform using ensemble learning and scalable pipelines.
Combining Intra-Risk and Contagion Risk for Enterprise Bankruptcy Prediction Using Graph Neural Networks	2022	A. Yu Zhao et al.	GNN model for predicting business failure and financial distress using SME data.
Improved Customer Lifetime Value Prediction With Sequence-To-Sequence Learning	2021	Josef Bauer & Dietmar Jannach	Uses sequence models to capture temporal purchase patterns for CLV prediction.
Small- and Medium-Enterprises Bankruptcy Dataset	2019	B. Zoriák, Drotár et al.	Introduces SME financial ratio dataset for regression and classification models.
Customer Lifetime Value Prediction Using Embeddings	2017	Benjamin P. Chamberlain et al.	Uses embeddings and ensemble regressors to efficiently predict CLV.

Table 1. "Expanded Literature Review Table on Financial Tracking and Analysis Models"

3 System Architecture

This is the architecture of the Financial Tracker application showing how users interact with the system.

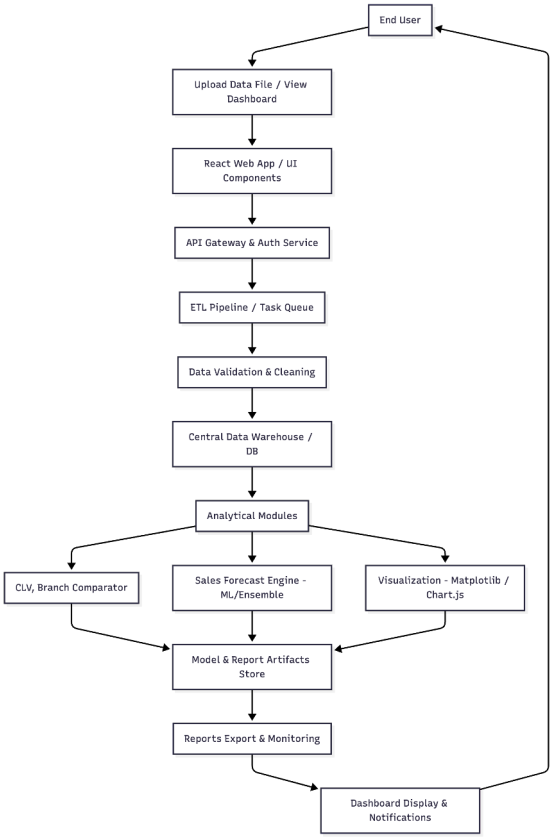

Fig. 1. Architecture Diagram for the Financial tracker

First, the user uploads a CSV file or accesses the dashboard through the React web application. The request passes through the API gateway and authentication service. The raw data is cleaned, validated, and stored in a central data warehouse.The analytics module calculates metrics such as Customer Lifetime Value (CLV), sales forecasting, and product demand using machine learning models like Random Forest and ensemble methods.Finally, the visualization module uses Chart.js and Matplotlib to generate graphs and dashboards which present insights to the user.

4 DISCUSSION

Upload excel or CSV File of monthly transactions Store the data into a single database consisting of all monthly transactions Give Visual Representations of data through bar graphs (individual product revenue , daily revenue) and line graph and pie charts Give Customer lifetime Value(CLV) to gain insights in customer behavior. Using linear regression give a forecast of the sales of individual products for better inventory management Compare the performance of the different branches and months Develop a financial analysis software to track, analyze, and visualize financial data. Automate financial data processing to reduce manual errors and inefficiencies Improve financial data organization and storage for easy access and management by creating a central repository Increase efficiency in financial decision-making with analytics and visualization Provide CLV for customer segmentation Forecast sales of individual items for better inventory management.

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