



# International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

*(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)*



**Impact Factor: 8.699**

**Volume 14, Issue 12, December 2025**

# AI Powered Budget Manager Transaction Security

Varshini K S, Akhila N

P.G. Student, Department of Master of Computer Application, PES Institute of Technology and Management,  
Shivamogga, Karnataka, India

Assistant Professor, Department of Master of Computer Application, PES Institute of Technology and Management,  
Shivamogga, Karnataka, India

**ABSTRACT:** Even though many people still struggle with overspending financial planning inaccurate tracking and vulnerability to fraudulent transactions modern digital financial platforms are widely used for managing personal expenses. The sophisticated automation real-time analytics and robust security features necessary for todays financial demands are absent from traditional budget management tools. In order to help users well manage their income expenses and spending patterns this study suggests an AI-powered Budget Monitoring and Transaction Security System. The system incorporates fraud detection support secure transaction processing automated smart budget tracking and intelligent visual reports. Users can monitor monthly budgets upload transaction files get categorized summaries and spot odd or dangerous activity and fraud detection support. The platform places a strong emphasis on speed accuracy and automated budget monitoring user-friendliness and safe data handling. According to experimental evaluation the system greatly increases user safety by spotting suspicious patterns decreases manual tracking time and raises financial awareness.

**KEYWORDS:** Budget management, Transaction security, Smart budget tracking, Fraud detection support, Automated budget monitoring.

## I. INTRODUCTION

People conduct financial transactions on a diversity of platforms in the current digital economy which makes managing personal finances more difficult than before. Monitoring spending classifying expenditures keeping track of budgets and manually identifying unexpected or fraudulent transactions are all difficult tasks for users. Basic features are offered by conventional budgeting tools but they lack automation sophisticated analytics and robust security measures. Modern systems are able to analyze transaction data produce precise insights identify anomalous activity and assist users in maintaining financial stability thanks to the development of AI and machine learning. The goal of this research is to create an AI-powered budget monitoring and transaction security system that effectively handles transaction data produces comprehensive visual reports and supports safety features for identifying unusual patterns. By classifying expenses displaying spending patterns warning users about overspending and protecting transaction data the suggested system streamlines financial decision-making. It provides an organized and clever method for managing digital finance.

The system then performs AI-driven anomaly detection which entails modeling where the transactions features are compared with the users historical behavior and global transaction patterns. When the unconventionalities are unusual for example a large payment made from an unaware device or multiple quick transfers red flags are raised or the transaction is blocked. Every movement of the sensitive data is tracked for auditing purposes and it is stored in extremely secure locations. The AI is continuously reskilled using the feedback on whether the transactions that were flagged were authentic or fraudulent.

## III. LITERATURE SURVEY

The concept of intelligent budget management systems emerged in early financial-tracking research, where traditional models relied on manual record-keeping and predefined rules to categorize expenses and monitor spending behaviour [1]. These early systems primarily focused on basic ledger automation, applying static thresholds to flag overspending without incorporating adaptive learning capabilities. As digital transactions increased, researchers introduced semi-automated expense-classification frameworks that utilized keyword matching and heuristic filters to organize financial

data more reliably [2]. Later works incorporated statistical analysis and pattern-based evaluation to understand user spending trends over time, improving the accuracy of monthly budgeting and detection of irregular transaction patterns [3]. In [4], the authors separated transaction analysis into semantic and numerical layers, processing textual descriptions and monetary values independently before synthesizing them into meaningful financial summaries. Approaches using visualization and behavioural analytics were introduced in [5] to enhance user awareness through interactive charts, trend mapping and real-time alerts.

#### IV. PROBLEM STATEMENT

Digital payments, UPI transfers, and online banking are rapidly increasing, and users are handling very large volumes of transactions monthly. It is labor-intensive and frequently produces inaccurate results to manually check every transaction for fraud or errors. Users are exposed to the risks of fraudulent transactions unauthorized access and undetected anomalies because almost all financial apps available today only support basic budget management and provide a very limited number of security features. There is currently no app or solution that allows the user to upload a file containing their transactions have the data repeatedly examined for potential fraud and present the information in an understandable manner. An application that can safely receive transaction data continuously scan the data for unusual patterns generate comprehensive reports and forecast the users future spending patterns or risk levels without requiring the user to be extremely methodical is becoming more and more in demand.

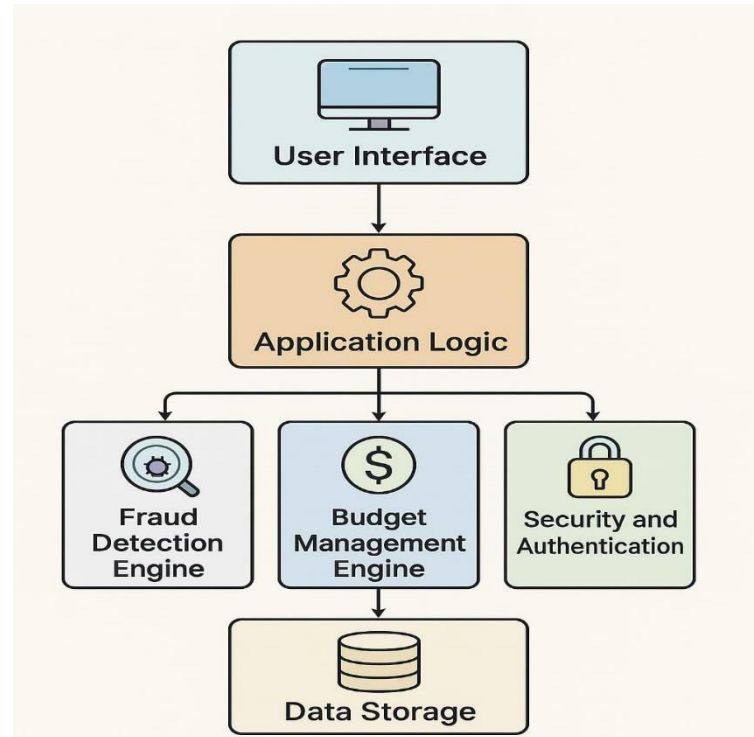
The lack of such a sophisticated AI-powered tool makes it difficult for small businesses and individuals to safeguard their finances and obtain accurate information from their digital transactions. In addition to transaction security users face challenges in managing daily income and expenses to ensure the stability of their financial plan. When integrated into a single platform a budget planner makes it simple for users to categorize their expenditures set spending caps and save money while also supporting fraud analysis. By combining basic budgeting with AI-based fraud detection users will be protected from dubious activities and gradually improve as money managers with just one application.

#### V. PROPOSED METHODOLOGY

The proposed methodology for the AI-Powered Budget Monitoring and Transaction Security System follows a structured workflow that ensures accurate financial analysis, intelligent insights, and secure data handling. User-uploaded transaction files are the first step in the process. They are verified and preprocessed by eliminating duplicates standardizing formats and classifying expenses using rule-based filtering. The system uses budget allocation logic after preprocessing to compare spending to predetermined limits and produce alerts for overspending. An anomaly detection module examines transaction patterns and based on departures from typical behavior detects anomalous or possibly fraudulent activity to improve security. Users can easily comprehend their financial patterns thanks to the visualization of the processed data through interactive charts category-wise summaries and downloadable reports. Lastly all sensitive financial data is kept private and secure throughout the system thanks to secure authentication procedures and encrypted data storage.



### System architecture

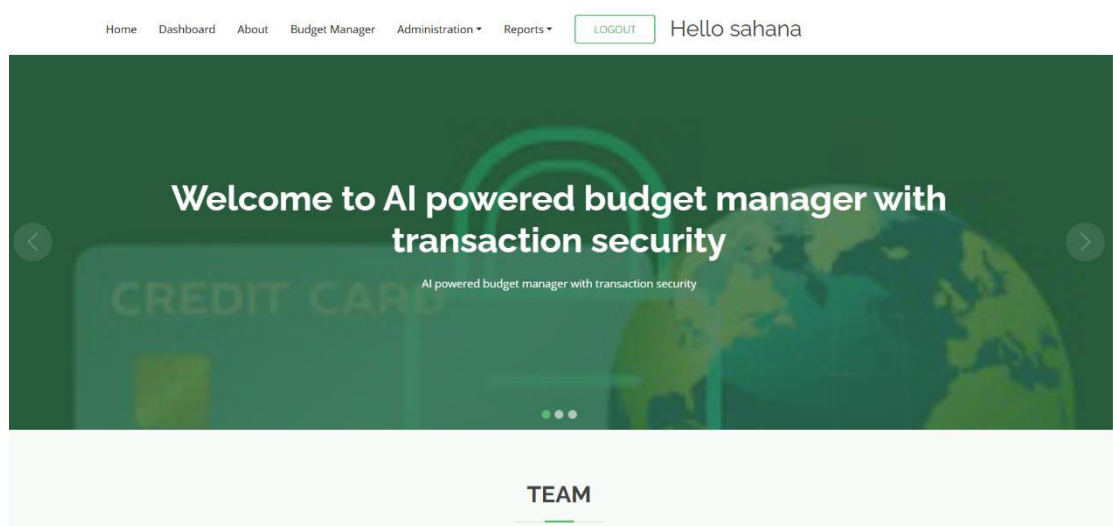


This system architecture consists of a number of interconnected modules that cooperate to provide safe and astute financial management. Through a web interface the user can manage transactions view budgets and log in to the system. The application server which is capable of handling all business logic and processing tasks is connected to the web interface. The server has an AI fraud detection to examine transaction data and identify any suspicious or fraudulent activity. The system uses the transaction security module to notify the user if any irregularities are discovered. The database safely stores all user and transaction data.

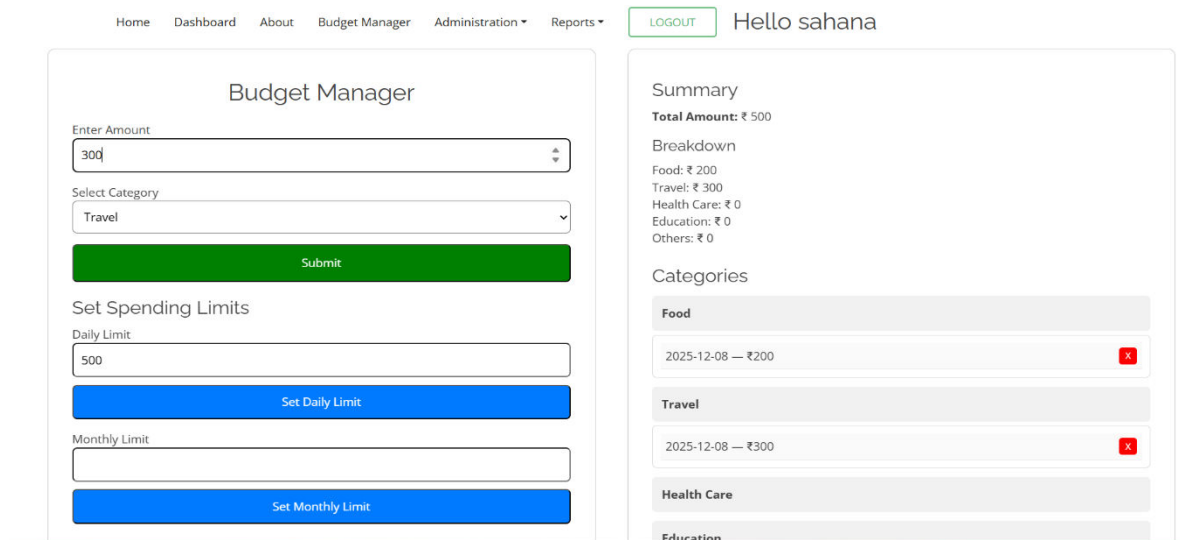
### Algorithms Used:

**Logistic Regression Algorithm:** Logistic Regression fit in to the category of supervised machine learning algorithms that can be cast-off for binary classification, wherever the outcome can be either 0 or 1. In the present work, we utilized Logistic Regression to categorize the uploaded transaction data as either Non-Fraudulent or Fraudulent. The algorithm has been observing the patterns in the data and concluding the likelihood that a exact transaction is fraudulent. A mathematical function known as the sigmoid function is utilized, which converts any numeric value into a probability of being between 0 and 1. The next step is to compare the computed probability with a predetermined threshold that is most often set to 0.5 to reach the final prediction. Additionally the model performs extremely well with smaller feature sets which is crucial since it rejects sensitive user data from the input file before making predictions. Logistic regression verifies that results are easily explicable and decision limitations are evident. This level of openness makes it easier to identify fraud in the projects circumstances. A machine learning method for binary classification the logistic regression container first calculates a weighted sum of the input features then uses the sigmoid function to convert that sum into a probability between 0 and 1

## VI. EXPERIMENTAL RESULTS



**Home page**



**Budget manager module**

Home	Dashboard	About	Budget Manager	Administration	Reports	LOGOUT	Hello sahana
------	-----------	-------	----------------	----------------	---------	--------	--------------

Credit Card Fraud Detection System - Fraud Analysis		
Algorithm Used		
Algorithm Name	Accuracy Score	Result
Logistic Regression	88.73%	Fraudulent Transaction
Data values entered by user		
Label	Value	
Time	0.0	
V1	-1.359807134	
V2	-0.072781173	
V3	2.536346738	
V4	1.378155224	
V5	-0.33832077	
V6	0.462387778	

### Result of single transaction file

Home	Dashboard	About	Budget Manager	Administration	Reports	LOGOUT	Hello sahana
------	-----------	-------	----------------	----------------	---------	--------	--------------

CREDIT CARD DATASET ANALYSIS	
Analysis of the Dataset	
Algorithm Name	Accuracy Score
Data Shape	(284807,31)
Unique Target Values	[0 1]
Percentage of Non-Fraudulent Transactions:	99.827%
Percentage of Fraudulent Transactions:	0.173%
Null Values	False
Total Fraudulent Transactions in Dataset	492
Total Normal Transaction in Dataset	284315
Credit Card Fraud Percentage according to dataset	

### Result of multiple transaction file

## VII. CONCLUSION

The AI Powered Budget Manager with Transaction Security presents a cutting-edge and secure approach to conducting digital financial transactions in a single platform. File upload capability, AI scam detection, predictive analytics, and user-friendly budget management features are all part of it. With this solution, users can not only see where their money goes but also be where their money is working to be and plan accordingly. The project, unlike traditional budgeting applications, is oriented towards financial planning and transaction security, thus it is of great benefit for individuals, small businesses, and even banks. The system is made to be scalable, and with its machine knowledge capabilities, the system can continually get better at fraud detection and can also get future features like real-time bank API integration or mobile app support.

**REFERENCES**

1. Financial fraud detection through the application of machine learning techniques: a literature review — Hernandez Aros et al. (2024)
2. Financial Fraud Detection Based on Machine Learning: A Systematic Literature Review Ali et al. (2022)
3. Smart Expense Tracking System Using Machine Learning — Aishwarya S. & Hemalatha S. (2023)
4. A machine learning based credit card fraud detection using the GA algorithm for feature selection — Journal of Big Data, 2022.
5. Detection of fraud in IoT based credit card collected dataset using machine learning Machine Learning with Applications, 2025.
6. Credit Card Fraud Detection utilizing Advanced ML and Blockchain Technologies International Journal of Intelligent Systems and Applications in Engineering, 2024.
7. OI Odufisan Harnessing Artificial Intelligence and Machine Learning for Enhanced Fraud Detection and Prevention in Nigeria Published: 2025
8. R. Thompson (PhD) How AI is Changing Personal Finance: Smart Budgeting with Agentic AI Published: February 25, 2025



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details