

“FinSight: Smart Expense & Budget Analyzer”

A

Report submitted in partial fulfilment of the requirement for the

degree of

B.Tech.

In

Computer Science & Engineering
(Data Science)

By

Abhishek Chaurasiya (2301641540004)

Aniruddh Pratap Singh (2301641540034)

Vishwajeet Gupta (2301641540212)

Arpan Shukla (2301641540051)

Chaitanya Pant (2301641540070)

Aryan Srivastava (2301641540055)

Under the guidance of

Ms. Alpana Singh

ASSISTANT PROFESSOR

Project Id: **26_DS_3A_13**



Pranveer Singh Institute of Technology, Kanpur
Dr A P J A K Technical University
Lucknow

DECLARATION

This is to certify that Report entitled “**FinSight: Smart Expense & Budget Analyzer**” which is submitted by me in partial fulfilment of the requirement for the award of degree B.Tech. in Computer Science and Engineering (Data Science) to Pranveer Singh Institute of Technology, Kanpur Dr. A P J A K Technical University, Lucknow comprises only our own work and due acknowledgement has been made in the text to all other material used.

Date:

Abhishek Chaurasiya (2301641540004)
Aniruddh Pratap Singh (2301641540034)
Vishwajeet Gupta (2301641540212)
Arpan Shukla (2301641540051)
Chaitanya Pant (2301641540070)
Aryan Srivastava (2301641540055)

CERTIFICATE

This is to certify that Report entitled “**FinSight: Smart Expense & Budget Analyzer**” which is submitted by **Abhishek Chaurasiya (2301641540004) Aniruddh Pratap Singh (2301641540034) Vishwajeet Gupta (2301641540212) Arpan Shukla (2301641540051) Chaitanya Pant (2301641540070) Aryan Srivastava (2301641540055)** in partial fulfilment of the requirement for the award of degree B.Tech. in Computer Science & Engineering (Data Science) to Pranveer Singh Institute of Technology, Kanpur affiliated to Dr. A P J A K Technical University, Lucknow is a record of the candidate own work carried out by him under my supervision. The matter embodied in this report is original and has not been submitted for the award of any other degree.

Signature:

Dr. Prashant Kumar Mishra
Head
Dept. of Data Science
PSIT, Kanpur

Signature:

Ms. Alpana Singh
Assistant Professor
Department of Data Science
PSIT, Kanpur

ACKNOWLEDGEMENT

*It gives us a great sense of pleasure to present the report of the B.Tech. Project undertaken during B.Tech. Third Year (Session: 2025-26). We owe special debt of gratitude to our project supervisor **Ms. Alpana Singh, Assistant Professor, Department of Computer Science and Engineering (Data Science), Pranveer Singh Institute of Technology, Kanpur** for his constant support and guidance throughout the course of our work. His sincerely, thoroughness and perseverance have been a constant source of inspiration for us. It is only his cognizant efforts that our endeavours have seen light of the day.*

*We also take the opportunity to acknowledge the contribution of **Professor Dr. Prashant Kumar Mishra, Head, Department of Data Science, Pranveer Singh Institute of Technology, Kanpur** for his full support and assistance during the development of the project.*

We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind assistance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution in the completion of the project.

Signature

Name: Abhishek Chaurasiya

Roll No.: 2301641540004

Signature

Name: Aniruddh Pratap Singh

Roll No.: 2301641540034

Signature

Name: Vishwajeet Gupta

Roll No.: 2301641540212

Signature

Name: Arpan Shukla

Roll No.: 2301641540051

Signature

Name: Chaitanya Pant

Roll No.: 2301641540070

Signature

Name: Aryan Srivastava

Roll No.: 2301641540055

ABSTRACT

*This project introduces **FinSight: Smart Expense & Budget Analyzer**, a web-based application designed to empower individuals with intelligent personal financial management. The work addresses the common challenges of fragmented financial data, the limitations of traditional historical reporting tools, and the absence of robust future expense forecasting.*

***FinSight** implements a comprehensive data science pipeline, beginning with automated ingestion and rigorous cleaning of raw financial transaction CSVs. An intelligent, rule-based engine categorizes transactions into a standardized framework, enabling clear and consistent financial oversight. The application provides intuitive, interactive visualizations of spending patterns over time and across categories, facilitating immediate insights into financial behavior. A core feature is the integration of a Seasonal AutoRegressive Integrated Moving Average (**SARIMA**) model, which accurately forecasts future aggregate monthly expenses, offering users a proactive tool for budgeting and financial planning.*

*The system is built on a modular client-server architecture, utilizing Streamlit for the user-friendly frontend and **FastAPI** for a high-performance backend, ensuring efficiency and scalability. Deployed on a cost-effective self-hosted server, **FinSight** demonstrates a practical solution for accessible financial intelligence. While the **SARIMA** model effectively captures trends, its sensitivity to sudden structural breaks was noted, indicating avenues for future enhancements like AI-driven anomaly detection and more granular forecasting. This project successfully transforms raw financial data into actionable insights, promoting improved financial literacy and proactive decision-making.*

Table of Contents

S. No.	Description	Page No.
1	DECLARATION	ii
2	CERTIFICATE	iii
3	ACKNOWLEDGEMENT	iv
4	ABSTRACT	v
5	LIST OF TABLES	vi-vii
6	LIST OF FIGURES	viii
CHAPTER 1.	INTRODUCTION	1-7
1.1	Motivation	1
1.2	Project Definition	1-2
1.3	Background Of the Problem	2-3
1.4	Project Objective	3-4
1.5	Project Specifications	4-5
1.6	Project Architecture and Components	7
CHAPTER 2	LITERATURE REVIEW	8-13
2.1	Survey of Existing System	8-9
2.2	Previous Work	9-10
2.3	Limitations of existing system or Research Gap	10-13
CHAPTER 3	PROBLEM STATEMENT	14
CHAPTER 4	PROPOSED WORK	15-18
4.1	Automated Data Ingestion and Robust Preprocessing	15
4.2	Intelligent Transaction Categorization Engine	15-16
4.3	Time-Series Preparation for Forecasting	16
4.4	SARIMA-Based Expense Forecasting Model	16-17
4.5	Interactive User Interface and Visualization (Streamlit Frontend)	17
4.6	Robust Backend API with FastAPI and Persistent Storage	17-18
4.7	Secure and Cost-Effective Deployment	18
CHAPTER 5	METHODOLOGY	19-25

5.1	Requirement Gathering & Analysis	19
5.2	System Design	20-23
5.3	Development Phases	23-25
CHAPTER 6	IMPLEMENTATION	26-30
6.1	Docker Integration and Railway Deployment	26-28
6.2	AI Integration	28-29
6.3	Database Implementation	29-30
CHAPTER 7	Results and Discussions	31-35
7.1	System Testing and Validation	31
7.2	Exploratory Data Analysis (EDA) Results	32-33
7.3	SARIMA Forecasting Model Analysis	33-34
7.4	System Performance and Efficiency	35
CHAPTER 8	Conclusion and Future Scope	36-38
8.1	Conclusion	36
8.2	Future Scope and Enhancements	37-38
CHAPTER 9	REFERENCES	39-40

List of Figures

S. No.	Description	Page No.
1.	Data Flow Design	21
2.	Class Diagram	23
3.	FinSight Architecture Design	26
4.	Spending Distribution by Category	32
5.	Monthly Expenses Over Time	33
6.	Future Expense Forecast	34