



**GURU TEJH BAHADUR 4<sup>TH</sup> CENTENARY ENGINEERING COLLEGE**

**G-8 AREA, RAJOURI GARDEN, NEW DELHI-110064**

## **ML powered Financial Dashboard**

### **INTERNSHIP REPORT**

#### **B.Tech in Computer Science and Engineering**

**Submitted by :**

Name : Saima  
Enrollment No. : 03423802722  
Batch : CSE - 1  
Course : B. Tech (CSE)  
Year : 2022-2026

**Under the guidance of :**

Mentor's Name : Ms. Geeta Yadav  
HOD(CSE) : S. Pradeep Singh

---

**Mentor's Signature**

Ms. Geeta Yadav

---

**HoD's Signature**

S. Pradeep Singh



# CERTIFICATE

OF INTERNSHIP

This certificate is awarded to



**SAIMA**

Has successfully completed the internship as a Software Development Engineer (SDE)  
at Bluestock Fintech (UDYAM-MH-01-0138001,NISM-202400180448)  
in the months of 1 Aug 2025 - 30 Sep 2025

A handwritten signature in blue ink.

**GANESH KARALE**

FOUNDER & CEO  
BLUESTOCK FINTECH



Scan to Verify Doc  
BFSD105162

30/09/2025

DATE

# Acknowledgement

I would like to express my sincere gratitude to **Bluestock Fintech Pvt. Ltd.** for giving me the opportunity to complete my internship as a **Software Development Engineer Intern** from **1st August 2025 to 30th September 2025**.

My special thanks go to **Ms. Geeta Yadav**, my mentor and the technical team at Bluestock Fintech, who guided me throughout the training period, providing me with invaluable insights into real-world software development and financial data handling.

My heartfelt appreciation extends to **S. Pradeep Singh**, Head of the Department of Computer Science and Engineering, for supporting industrial training initiatives that bridge academic learning with professional experience.

Lastly, I would like to thank my family and friends for their constant encouragement and support throughout the internship period.

SAIMA

*B. Tech CSE (2022–2026)*

*Guru Tegh Bahadur 4<sup>th</sup> Centenary Engineering College*

# Declaration

I hereby declare that the Summer Internship Report entitled "***ML-Powered Financial Dashboard***" is an original work carried out by me during my internship at *Bluestock Fintech Pvt. Ltd.* from 1st August 2025 to 30th September 2025.

The project was executed under the guidance of ***Ms. Geeta Yadav***, my mentor. The work presented here is genuine and has not been submitted to any other institution or university for any degree or diploma.

*Date: 06<sup>th</sup> Nov, 2025*

*SAIMA*

*03423803722*

*B.Tech (Computer Science and Engineering)*

*Guru Tegh Bahadur 4th Centenary Engineering College*

Student 's Signature: \_\_\_\_\_

Mentor's Signature: \_\_\_\_\_

Head of Department: \_\_\_\_\_

(CSE)

# Table of Contents

S. No.	Contents	Page No.
—	Abstract	6
<b>Chapter–1</b>	<b>Introduction</b>	<b>7–11</b>
1.1	Background	7
1.2	Purpose of the Project	8
1.3	Problem Statement	8
1.4	Objectives	9
1.5	Scope of the Project	10
1.6	Tools and Technologies	11
<b>Chapter–2</b>	<b>Literature Review</b>	<b>12–13</b>
2.1	Overview of Financial Analysis Systems	12
2.2	Role of Machine Learning in Financial Analysis	12
2.3	Previous Work	13
2.4	Conclusion of Literature Review	13
<b>Chapter–3</b>	<b>System Analysis and Design</b>	<b>14–16</b>
3.1	Requirement Analysis	14
3.2	System Architecture	15
3.3	User Interface Design	16
<b>Chapter–4</b>	<b>Project Work, Screenshots &amp; Observations</b>	<b>17–24</b>
4.1	Overview of Project Implementation	17
4.2	Project Modules	18
4.2.1	Data Fetching Module	18
4.2.2	ML Analysis Module	19
4.2.3	Database Integration Module	20
4.2.4	Frontend Dashboard Module	21

4.3	Observations and Findings	23
<b>Chapter-5</b>	<b>Conclusion and Key Learnings</b>	<b>25–28</b>
5.1	Conclusion	26
5.2	Key Learnings	25
5.3	Future Scope	27
5.4	Final Thoughts	28
—	References	29

# Abstract

The **ML Powered Financial Analysis Dashboard** project focuses on automating financial data analysis by integrating API-driven data fetching, machine learning-based evaluation, and real-time visualization.

The system collects key financial statements — including **Balance Sheets**, **Profit & Loss**, and **Cash Flow Reports** — for companies listed in **Nifty 100**. Using the **StockTicker API**, the backend fetches structured financial data, which is then processed using **Python**, **Pandas**, and **Scikit-learn** libraries to identify key performance indicators.

The processed data is categorized into **Pros** (e.g., debt-free, strong ROE, good dividend payout) and **Cons** (e.g., poor sales growth, low ROE, no dividends). These insights are stored in a **MySQL** database and visualized on a custom-built **frontend web dashboard** for end-users.

The dashboard enables comparative company analysis, helping investors and analysts understand trends without manual data crunching.

The project demonstrates the application of **Machine Learning in Finance**, **practical API integration**, **data engineering**, and **frontend-backend connectivity**. It provided valuable exposure to the complete software development lifecycle during the internship at **Bluestock Fintech Pvt. Ltd.**

---

***Chapter - 01***

---

## **Introduction**

## 1.1 Background

In the rapidly evolving world of finance, data plays a crucial role in strategic decision-making. Modern financial markets generate massive volumes of data every second — ranging from stock prices and balance sheets to company fundamentals and investor sentiment.

Manual analysis of such data is not only time-consuming but also prone to errors. Machine Learning (ML) provides the tools to extract valuable insights, automate evaluation, and assist in predicting financial trends with improved accuracy.

This project combines **financial analytics and machine learning** into a single platform — the *ML-Powered Financial Dashboard*. It bridges the gap between raw financial data and actionable insights for analysts, investors, and decision-makers.

## 1.2 Purpose of the Project

The purpose of this project is to develop an automated platform that:

- Fetches live financial data from an authenticated API source.
- Performs intelligent analysis using ML techniques.
- Identifies pros and cons of company performance.
- Displays results in a user-friendly dashboard for real-time access.

The project aims to help non-technical financial analysts interpret large datasets quickly while improving transparency and accessibility in financial reporting.

## 1.3 Problem Statement

Most financial analysis today depends on human interpretation of static reports. This process involves downloading data from multiple sources, cleaning it manually, and calculating metrics like Return on Equity (ROE) or Profit Growth.

Such a method lacks scalability and is prone to human bias.

Thus, the problem this project solves is:

“How can we automate financial statement analysis for multiple companies using machine learning and present it in an interactive, real-time dashboard?”

## 1.4 Objectives

- Automate financial data collection using REST APIs.
- Perform preprocessing and transformation of tabular financial data.
- Train machine learning models to categorize company performance.
- Store results in a relational database (MySQL).
- Visualize company metrics on an intuitive dashboard.
- Support comparisons across multiple companies dynamically.

## 1.5 Scope of the Project

The project focuses on **listed companies under Nifty 100**. It covers:

- Integration with the **StockTicker API** to retrieve company-specific data.
- Implementation of ML models that identify financial strengths and weaknesses.
- Design of a **frontend web dashboard** for user-friendly visual access.
- Storage of insights for long-term analysis using MySQL.

Future extensions may include:

- Forecasting stock trends using time-series models.
- Integration with real-time APIs for intraday analysis.
- Secure authentication and user-based dashboards.

## 1.6 Tools and Technologies

Category	Tools/Technologies Used
Programming Language	Python
Libraries	Pandas, Scikit-learn, Requests, SQLAlchemy
Database	MySQL

Frontend	HTML, CSS, JavaScript
IDE	VS Code
API	StockTicker API (Bluestock Fintech)
Server	Flask / Node.js
Hosting	Bluestock Fintech Web Server
Dataset	Nifty100Companies

---

## *Chapter 2*

---

## Literature Review

## 2.1 Overview of Financial Analysis Systems

Financial analysis systems are designed to help analysts and investors understand the financial health of a company by using data-driven insights. These systems process balance sheets, profit and loss accounts, and cash flow statements to evaluate profitability, liquidity, and growth. Over the years, financial technology (fintech) solutions have evolved from manual calculations to automated dashboards that analyze large volumes of data in real time.

Despite their advantages, many traditional systems are still complex and require significant manual effort for data collection and report generation. The **Machine Learning Financial Dashboard** aims to simplify this process by using automation and real-time data visualization to make financial interpretation faster, accurate, and more accessible for users at different levels of expertise.

## 2.2 Role of Machine Learning in Financial Analysis

Machine Learning has transformed how financial data is interpreted and utilized. It allows systems to identify patterns, detect anomalies, and make predictions based on large historical datasets. In financial analysis, ML algorithms can evaluate key indicators such as Return on Equity (ROE), profit growth, or debt ratios and automatically classify them into meaningful categories for decision-making.

The inclusion of ML in financial dashboards ensures unbiased and data-backed insights. By applying models to classify company performance into “pros” and “cons,” the system enables investors to understand complex datasets at a glance. This automation not only saves time but also increases consistency in evaluation, making financial analysis more reliable.

## 2.3 Previous Work

Previous systems used manual financial ratio analysis or rule-based logic to interpret data. While effective for smaller datasets, these methods could not handle real-time updates or large-scale company data. With advancements in data science, financial tools now integrate APIs, Python-based analytics, and visualization libraries like Plotly and Chart.js to improve accuracy and interactivity.

The **ML Financial Dashboard** builds upon this progress by combining API-based data fetching, automated ML operations, and live dashboard visualization. This integration represents a step forward from earlier, semi-automated systems to a fully intelligent analysis platform.

## 2.4 Conclusion of Literature Review

The review highlights that modern financial systems are shifting from manual analysis toward automation and intelligence. Machine Learning provides the foundation for accurate, scalable, and adaptive financial evaluation. By merging ML algorithms, database integration, and web visualization, the **ML Financial Dashboard** effectively demonstrates how technology can transform raw financial data into actionable insights.

---

*Chapter 3*

---

## **System Analysis & Design**

### 3.1 Requirement Analysis

A proper understanding of system requirements ensures the successful development of a project. The proposed system combines backend automation with a web-based frontend to offer real-time financial analysis.

Requirement Type	Description
Hardware	System with minimum 8GB RAM and Intel i5 processor
Software	Python 3.10, MySQL, Flask, VS Code
Frontend	HTML, CSS, JavaScript
Functional	Fetch data, process using ML, store results, display on dashboard
Non-Functional	Accuracy, scalability, security, and user-friendliness

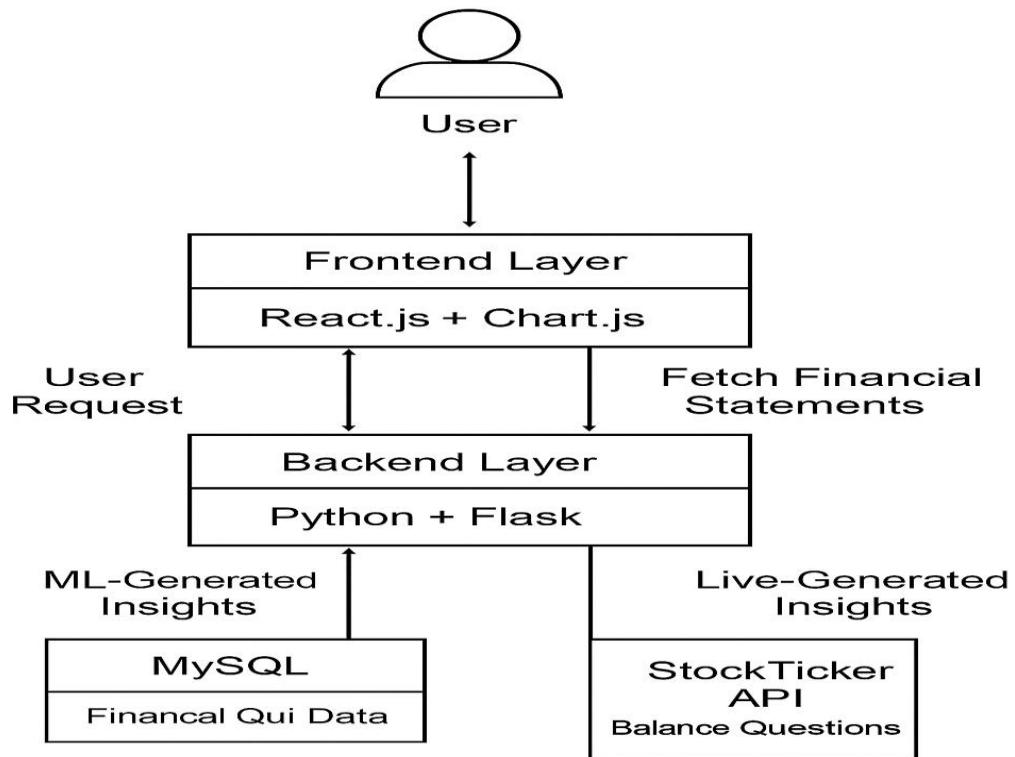
The system is designed to fetch financial data from APIs, process it through Python scripts, and visualize the results dynamically through a browser interface.

### 3.2 System Architecture

The architecture of the **ML Financial Dashboard** follows a modular approach consisting of four key layers:

1. **Data Fetching Layer** – Collects financial information from the StockTicker API.
2. **Processing Layer** – Uses ML algorithms to categorize metrics into pros and cons.
3. **Database Layer** – Stores insights and analysis results into a MySQL database.
4. **Presentation Layer** – Displays the data through a web-based dashboard.

Each layer communicates with the next through REST APIs and SQL queries. This layered structure ensures reliability, reusability, and scalability.



### 3.3 User Interface Design

The web interface is designed to be intuitive and responsive. The main pages include:

- **Homepage:** Displays the list of all analyzed companies with quick summary insights.
- **Company Analysis Page:** Shows pros, cons, and financial highlights for selected companies.
- **Comparison Page:** Enables users to compare multiple companies side by side.
- **Admin Panel (optional):** Allows authorized users to trigger analysis updates and view system logs.

The dashboard uses a minimal design focused on clarity and data readability, making complex financial analysis accessible to non-technical users.

---

***Chapter 4***

---

## **Project Work, Screenshots & Observations**

## 4.1 Overview of Project Implementation

The implementation of the **ML Financial Dashboard** was divided into three main phases — backend development, machine learning integration, and frontend visualization. Each phase contributed to building a complete automated analysis system capable of handling large amounts of financial data efficiently.

The workflow begins with fetching data using the **StockTicker API**. Once data is received, Python scripts process it using **Pandas** for data manipulation and **Scikit-learn** for ML operations. The analyzed results are stored in a MySQL database and later displayed on the **Bluestock Fintech** web application.

## 4.2 Project Modules

### 4.2.1 Data Fetching Module

This module interacts directly with the API endpoint:

`https://bluemutualfund.in/server/api/company.php?id={company_id}&api_key=ghfkffu6378382826hhdjgk`

It retrieves company-specific data such as Balance Sheet, Profit & Loss, and Cash Flow statements. The data is cleaned and converted into structured DataFrames using Python.

### 4.2.2 ML Analysis Module

The ML analysis module forms the core of the project. It processes numerical fields like sales growth, ROE, and dividend payout. Based on predefined conditions, metrics above 10% are marked as *pros* and those below 10% as *cons*.

Example:

- **Pros:** “Company has reduced debt,” “High ROE of 47%,” “Healthy dividend payout of 66.”
- **Cons:** “Low sales growth of 9.5%,” “Low ROE of 8.3%,” “No dividend declared.”

The model uses linear regression and logical conditions to generate meaningful statements for each company automatically.

### 4.2.3 Database Integration Module

This module stores the processed data in a MySQL database under a table named `ml`. The table contains columns for company name, analysis date, pros, and cons. SQLAlchemy is

used for secure data insertion and retrieval. The database acts as a permanent storage layer, allowing results to be retrieved at any time for visualization.

#### **4.2.4 Frontend Dashboard Module**

The dashboard provides a user-friendly interface where all results are displayed.

Main pages include:

- **View All Companies:** Shows summarized results for each analyzed company.
- **Company Page:** Displays detailed ML-generated insights.
- **Comparison Section:** Enables cross-company evaluation through graphs and tables.

### **4.3 Observations and Findings**

The system efficiently automated the end-to-end process of financial data analysis. It was observed that the ML classification logic correctly categorized companies based on profitability and performance. Real-time data fetching through APIs ensured that results remained updated with the latest figures.

The dashboard's design allowed even non-financial users to interpret company performance at a glance. However, the quality of insights largely depended on the accuracy of the data provided by the API. Integrating additional APIs in the future could further enhance reliability and coverage.



## Find the best with **Stock Analytics**



Search for a company



### Tata Consultancy Services Ltd

Tata Consultancy Services is the flagship company and a part of Tata group. It is an IT services, consulting and business solutions organization that has been partnering with many of the world's largest businesses in their transformation journeys for over 50 years. TCS offers a consulting-led, cognitive powered, integrated portfolio of business, technology and engineering services and solutions.

**Website:** <https://www.tcs.com/>

**Chart:** [Launch Chart](#)

**Symbol:** TCS

## Analysis

# Analysis Generated Using ML

### Compounded Sales Growth

10 Years: 11%

5 Years: 10%

3 Years: 14%

TTM: 5%

### Compounded Profit Growth

10 Years: 9%

5 Years: 8%

3 Years: 12%

TTM: 8%

### Return on Equity

10 Years: 40%

5 Years: 44%

3 Years: 47%

Last Year: 52%

## Pros and Cons

● Generated Using Machine Learning

### Pros

Company is almost debt free.

Company has a good return on equity (ROE) track record:  
3 Years ROE 47.4%

Company has been maintaining a healthy dividend payout  
of 66.2%

### Cons

Stock is trading at 15.2 times its book value

The company has delivered a poor sales growth of 10.5%  
over past five years.

## Balance Sheet

Consolidated Financial Reports. All Figures in INR Crores

Year	Equity Capital	Reserves	Borrowings	Other Liabilities	Total Liabilities	Fixed Assets	CWIP	Investments	Other Assets	Total Assets
Mar 2013	196.0	38350	332	13054	51932	9828	1895	1897	38312	51932
Mar 2014	196.0	48999	297	17337	66829	9544	3168	3434	50682	66829
Mar 2015	196.0	50439	358	22325	73318	11638	2766	1662	57252	73318
Mar 2016	197.0	70875	245	16974	88291	11774	1670	22822	52025	88291
Mar 2017	197.0	86017	289	15830	102333	11701	1541	41980	47111	102333

## Profit and Loss

Consolidated Financial Reports. All Figures in INR Crores

Year	Sales	Expenses	Operating Profit	OPM (%)	Other Income	Interest	Depreciation	Profit Before Tax			Net Profit	EPS
								Tax (%)	Tax (\$)	EPS		
Mar 2013	62989	44950	18040	29	1178	48	1080	18090	22	14076	36	
Mar 2014	81809	56657	25153	31	1637	39	1349	25402	24	19332	49	
Mar 2015	94648	70167	24482	26	3720	104	1799	26298	24	20060	51	
Mar 2016	108646	77969	30677	28	3084	33	1888	31840	24	24338	62	

## Cash Flow

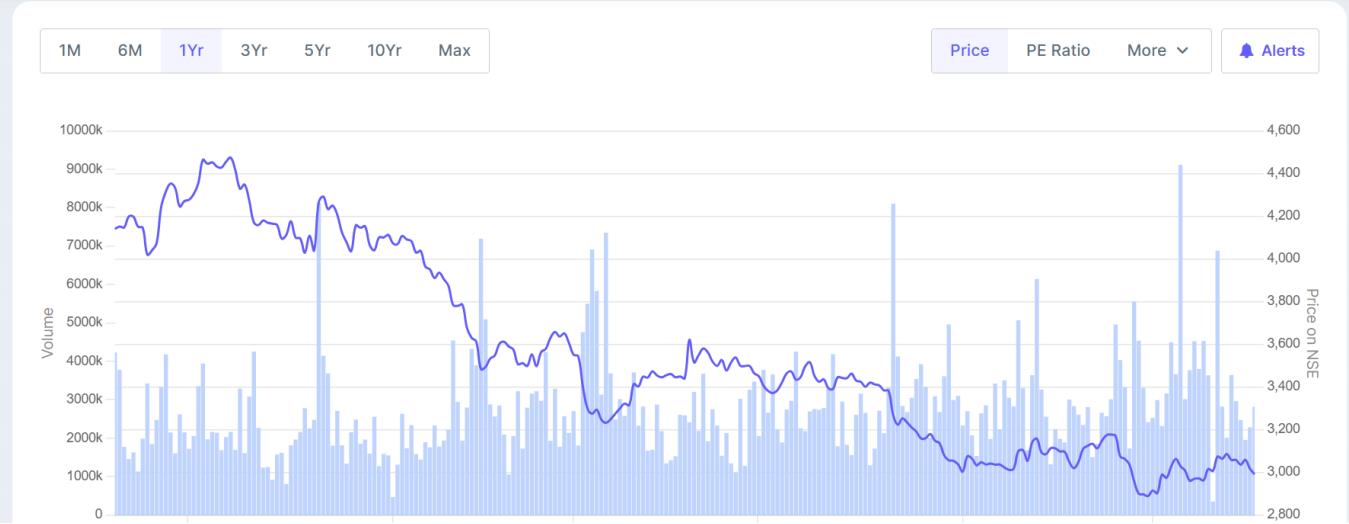
Consolidated Financial Reports. All Figures in INR Crores

Year	Net Cash from Operating Activities	Net Cash from Investing Activities	Net Cash from Financing Activities	Net Increase in Cash
Mar-13	11615	-6038	-5729	-152
Mar-14	14751	-9452	-5673	-374
Mar-15	19369	-1807	-17168	394
Mar-16	19109	-5010	-9666	4433
Mar-17	25223	-16895	-11026	-2698
Mar-18	25067	3104	-26885	1286

## Documents

Year	Annual Report
2024	<a href="#">View Report</a>
2023	<a href="#">View Report</a>
2022	<a href="#">View Report</a>
2021	<a href="#">View Report</a>
2020	<a href="#">View Report</a>
2019	<a href="#">View Report</a>

<https://www.bseindia.com/xml-data/corpfilng/AttachHis/d57e49b6-fd89-4fa8-b591-4f590100db1e.pdf>



---

***Chapter 5***

---

## **Conclusion & Key Learning**

## 5.1 Conclusion

The **ML-Powered Financial Dashboard** successfully demonstrates how machine learning can automate financial analysis, reducing manual effort while improving precision. The project integrated multiple technologies — including API handling, Python-based ML, database management, and frontend visualization — into one complete system.

This solution not only supports quick evaluations but also provides insights that can guide investment and policy decisions. Through automation and real-time monitoring, the project highlights how fintech innovation can simplify complex financial evaluations.

## 5.2 Key Learnings

During this internship, I gained valuable hands-on experience in:

- Fetching and integrating live data from REST APIs.
- Applying ML models for financial evaluation.
- Designing and managing MySQL databases.
- Developing responsive web interfaces for data visualization.
- Working in a structured fintech environment with collaborative tools and agile practices.

This internship also improved my problem-solving, debugging, and version control skills using Git and VS Code.

## 5.3 Future Scope

The system can be extended with the following improvements:

- Integration of **Deep Learning models** for predicting future financial outcomes.
- Addition of **sentiment analysis** using financial news and market trends.
- Implementation of **role-based authentication** for user-specific dashboards.
- Cloud deployment for real-time scalability and continuous updates.
- Enhanced graphical analytics using **Plotly** or **D3.js** libraries.

## 5.4 Final Thoughts

The internship at **Bluestock Fintech Pvt. Ltd.** provided a deep understanding of how real-world financial systems operate and how data-driven solutions are built in the fintech industry. It offered exposure to backend logic, machine learning, and web development simultaneously.

Overall, this project was a significant step in applying theoretical knowledge to practical use, reinforcing my interest in data-driven software development and financial analytics.

# **References**

1. Bluestock Fintech Pvt. Ltd. Internal Documentation
2. StockTicker API – <https://bluemutualfund.in/server/api/company.php>
3. Scikit-learn Documentation – <https://scikit-learn.org>
4. Pandas Documentation – <https://pandas.pydata.org>
5. MySQL Developer Guide – <https://dev.mysql.com/doc>
6. Flask Framework – <https://flask.palletsprojects.com>