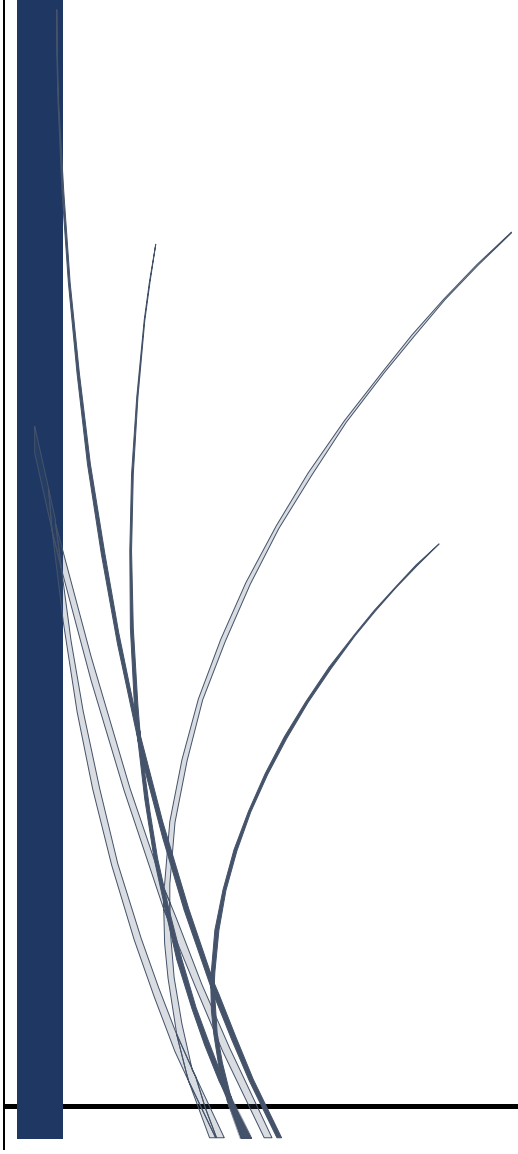
Project Report

Summer Internship



“Quantitative Analysis of NIFTY50 Constituents’’

A PROJECT REPORT

Submitted by

Harsh J. Patel

220780107008

In partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

Computer Engineering

Smt. S. R. Patel Engineering College, Unjha

Gujarat Technological University, Ahmedabad

[July, 2025]

Smt. S. R. Patel Engineering College

Road, Dabhi Unjha, Unjha - Patan Hwy, Unjha, Shihi, Gujarat 384170

CERTIFICATE

This is to certify that the project report submitted along with the project entitled **Quantitative Analysis of NIFTY50 Constituents** at **CSRBOX** has been carried out by **Harsh J. Patel** under my guidance in partial fulfillment for the degree of Bachelor of Engineering in Computer Engineering, 7th Semester from 2nd July 2025 to 16th July 2025 of Gujarat Technological University, Ahmadabad during the academic year 2024-25.

Prof. Shirin Patel — Internal Guide

Prof. Jitendra R. Patel — Head of the Department

Internship Offer Letter

Internship Offer Letter

Date: 27/06/2025

Dear Harsh Jayantilal Patel,

Congratulations on being selected for the 2-weeks DA GTU Summer Internship 2025.

This exclusive internship empowers students with industry-relevant DA skills through a curated and practical learning experience. It is designed to help you grow both technically and professionally, bringing you one step closer to achieving your dream job.

This exclusive two-week internship is specially curated for 7th Semester students of Gujarat Technological University (GTU) across all branches under Subject Code: 3170001. The internship will be conducted entirely in virtual mode from 2nd July to 16th July 2025.

As part of the program, students will also work on real-time DA projects aligned with UN Sustainable Development Goals (SDGs) and showcase their learnings. Students will get a chance to engage in expert-led masterclasses, mentoring meetings, doubt-solving sessions, and interactive webinars with industry professionals. This internship will run 2 weeks from 02nd July 2025 to 16th July 2025.

Internship Benefits:

- Gain access to digital learning Platform with curated courses on Emerging technologies relevant to the industry.
- Enhance your learning experience in a project-based, collaborative environment.
- Participate in masterclasses led by Subject Matter Experts.
- Demonstrate your capabilities by working on real-world projects.
- Earn certifications/badges strengthens your professional profile.


S.R.P.E.C

Structure of Internship		
Week 1	Offer letter welcome	Welcome to the Data Analytics Internship Program
	Orientation Session Artificial Intelligence	Get oriented to the program
	Masterclass 2	Masterclass by Industry Experts on Data Cleaning and Preparation
Week 2	Masterclass 3	Masterclass by Industry Experts on Data Visualization Techniques
	Masterclass 4	Masterclass by Industry Experts Design Thinking Principles
	Problem Statement Masterclass	Project Guidance session
	Mentoring session	Career and Learning Opportunities

Certification Requirements:

- Complete the learning plan on Digital Learning Platform.
- Submit and present a final project.
- Adhere to the internship schedule and participation requirements.

Stipend: Please note that this internship is unpaid.

Chandni Patel

Chandni Patel,
Associate Vice President - People and Culture

Smt. S. R. Patel Engineering College

Road, Dabhi Unjha, Unjha - Patan Hwy, Unjha, Shihi, Gujarat 384170

DECLARATION

I hereby declare that the Internship / Project report submitted along with the Internship / Project entitled **Quantitative Analysis of NIFTY50 Constituents** submitted in partial fulfillment for the degree of Bachelor of Engineering in Computer Engineering to Gujarat Technological University, Ahmedabad, is a Bonafide record of original project work carried out by me at **CSRBOX** under the supervision of Chandni Patel and that no part of this report has been directly copied from any student`s reports or taken from any other source, without providing due reference.

Name of the Student Sign of Student

Harsh J. Patel _____

Acknowledgment

I would like to express my sincere gratitude to **CSRBOX** for giving me the opportunity to work as an intern at their esteemed organization. This internship has been a great learning experience and has helped me gain valuable knowledge in the field of Data Analytics using Excel and Tableau.

I am especially thankful to MS. Chandni Patel, Project Manager and my internal guide, for his continuous support, technical guidance, and feedback throughout the internship. His mentorship played a crucial role in helping me complete the assigned tasks successfully.

I also thank Mr. Kartik Hooda, Data Analytics Expert, for facilitating the internship process and providing the necessary arrangements during my time at the company.

I am grateful to Prof. Shirin Patel, my faculty guide at Smt. S. R. Patel Engineering College, for their academic guidance and support throughout the internship duration.

Lastly, I would like to thank all the faculty members, my friends, and family who encouraged and supported me during this journey.

Abstract

"Quantitative Analysis of NIFTY50 Constituents" focuses on the quantitative analysis of the NIFTY50 index constituents using data visualization techniques to evaluate financial health, valuation metrics, and investment potential. The NIFTY50

index represents the top 50 listed companies on the National Stock Exchange (NSE) and serves as a benchmark for the Indian equity market.

Using tools such as Excel for data cleaning and Tableau for visualization, this project builds a comprehensive dashboard that presents metrics like Market Capitalization, Profit Margin, Return on Equity (ROE), Price-to-Earnings (P/E) Ratio, and Promoter Holdings. Each metric is visualized through dynamic charts to enable comparison across sectors and companies.

The goal of "Quantitative Analysis of NIFTY50 Constituents" to deliver an interactive and data-driven platform for investors, analysts, and students to interpret financial ratios effectively, identify outliers, and derive meaningful insights. The project strengthens understanding of financial KPIs and data analytics by transforming raw stock market data into actionable visual stories.

This analysis ultimately supports informed decision-making in the field of finance and investment, bridging the gap between data science and capital market research.

This project bridges the gap between raw financial data and strategic decision making. Whether you're a student, investor, or analyst, it offers clear, data-driven insights into India's largest companies. By transforming numbers into narrative visuals, it empowers smarter trading, portfolio planning, and market understanding — making it a powerful contribution to financial literacy and analytics education.

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Chapter 3 Skills Learned

1. Introduction

1.1 About the Company

CSRBOX is India's leading platform for Corporate Social Responsibility (CSR), social impact, and development sector insights. It bridges the gap between companies, NGOs, foundations, and government bodies by offering tech-enabled solutions, research, consulting, and implementation support for CSR projects. CSRBOX is a unit of Reanalysis Consultants Pvt. Ltd., based in Ahmedabad, Gujarat.

Mission and Vision:

Mission: To catalyse impactful social development by integrating data, technology, and strategy across CSR and philanthropic ecosystems in India. To become the largest impactoriented ecosystem enabler in India by creating innovative platforms, research, and partnerships that accelerate sustainable development.
Vision: To become the largest impact-oriented ecosystem enabler in India by creating innovative platforms, research, and partnerships that accelerate sustainable development.

Core Services:

1. **CSR Implementation Support**: End-to-end program design and execution for

companies and foundations. Focus sectors: education, health, skill development, livelihoods, and women empowerment.

2. Social Impact Consulting: Strategic planning for CSR, sustainability, and ESG goals. Needs assessments, baseline surveys, and impact evaluation.

3. Tech for Good Solutions: Custom software and platforms for CSR project monitoring and reporting. Tools for grant management, NGO discovery, and dashboard analytics.

4. Research and Knowledge Products: India's largest CSR data intelligence hub, including CSR reports, impact stories, and case studies. CSR mapping, sector reports, and policy insights.

5. NGO Capacity Building: Workshops, training, and accelerator programs to 1 empower grassroots non-profits.

Company Culture

- **Collaborative & Mission-Driven**: Focused on cross-sector impact and partnerships
- **Innovation-Oriented**: Uses tech and research to simplify CSR processes.
- **Outcome-Focused**: Emphasizes measurable results and long-term sustainability.
- **Empowering**: Builds capacity of both funders and implementers.

1.2 Aim and Objectives of the Internship

Core Aims:

To bridge the gap between CSR funders (companies) and implementers (NGOs and social enterprises).
To enhance the effectiveness of CSR investments by providing data-driven insights, strategy, and execution models.
To empower grassroots organizations through visibility, funding opportunities, and capacity building.
To serve as a one-stop platform for CSR collaboration, learning, and innovation across sectors and regions.

Key Objectives:

1. Enable Strategic CSR Investments
Help corporates align their CSR strategy with national development priorities and local needs.
Guide funders to high-impact, scalable projects across focus areas like education, healthcare, skill development, and sustainability.

2. Build and Strengthen NGO Capacities
Provide access to training, tools, and fundraising support.
Offer digital visibility and project listing via their platform.

3. **Drive Innovation in Social Impact**
Promote use of technology, AI, and data platforms to monitor, evaluate, and report CSR outcomes.
Develop customized solutions like CSR Impact Dashboards and project mapping tools.

4. Promote Transparency and Accountability
Maintain India's most comprehensive CSR project database.
Support compliance with CSR laws under Section 135 of the Indian Companies Act.

5. Conduct Research and Thought Leadership
Publish sectoral reports, white papers, and success case studies.
Highlight best practices to improve CSR efficiency and replication.

2. Roles and Responsibilities during internship

During my internship at CSRBOX, I was actively involved in various tasks related to CSR project analysis, research, and digital content development. The internship provided me with practical exposure to India's CSR ecosystem, data platforms, and social impact strategy.

2.1 Daily Tasks and Activities

CSR Data Research: Collected and analysed CSR spending data of NIFTY50 companies, including their focus sectors, budgets, and impact regions using CSRBOX's tools and public disclosures.

Content and Report Drafting: Assisted in preparing case studies, summaries, and blog-style writeups on CSR best practices and flagship projects. Ensured content accuracy and alignment with SDG indicators.

CSR Project Mapping: Mapped companies' CSR projects to thematic areas like education, health, sustainability, and skill development. Created structured tables and visual summaries for internal dashboards.

Dashboard Conceptualization: Contributed to ideation of Tableau/Power BI dashboard layouts for visualizing CSR data trends such as top spenders, sectoral impact, and geographic outreach.

NGO Profiling: Researched verified NGOs, documenting their impact stories, flagship initiatives, and readiness for CSR collaborations. Helped update the NGO listing page.

2.2 My Roles and Responsibilities

- Generated comparison tables and charts of top CSR funders and sectors using Excel and Tableau Public.
- Helped map CSR activities to relevant UN Sustainable Development Goals (SDGs).
- Drafted content for internal reports and visual dashboards highlighting trends in CSR spend, beneficiary reach, and focus themes.
- Contributed ideas for dashboard interactivity, filters (e.g., year, sector, geography), and layout design.

2.3 Problem-Solving

Throughout the project, I encountered several challenges related to financial data accuracy, visualization clarity, and user-focused dashboard design. Solving these problems not only improved the quality of the dashboard but also enhanced my analytical and decision-making skills. Below are the key problems and how I addressed them: **1. Raw Financial Data Was Incomplete or Unstructured**

Problem:
The data collected from sources like NSE and Yahoo Finance lacked essential financial ratios such as **Profit Margin**, **Return on Equity (ROE)**, and **P/E Ratio**. Additionally, data formats varied significantly.

Solution:
I used **Excel** to clean and transform the data. I calculated missing ratios using standard formulas:

- Profit Margin = (Net Profit ÷ Sales) × 100
- ROE = (Net Profit ÷ Shareholder's Equity) × 100
- P/E Ratio = (Price per Share ÷ Earnings per Share)

I created new columns with these values and standardized number formatting across the sheet.

Outcome:
I created a structured and complete dataset ready for seamless import into Tableau, enhancing reliability of the insights.

2. Charts Were Overcrowded and Difficult to Interpret

Problem:
Initial dashboards displayed too much information at once, leading to cluttered visuals and poor user experience.

Solution:
I redesigned the dashboard by:

- Grouping companies by **sector**
- Adding **filters and dropdowns** for interactivity
- Splitting visuals into **thematic dashboards** (e.g., Profitability, Valuation, Ownership)

Outcome:
The updated design allowed users to explore the data more intuitively, improving readability and interaction.

3. Difficulty in Comparing Companies Across Metrics

Problem:
Comparing companies using multiple metrics like ROE, P/E, and Profit Margin was difficult in a single static view.

Solution:
I implemented **scatter plots and bubble charts** in Tableau. For example:

- X-axis: ROE
- Y-axis: Dividend Yield
- Size: Market Cap
- Colour: Sector

I also used **colour-graded heatmaps** to highlight top/bottom performers.

Outcome:
This approach enabled **quick identification of outliers** and investment-worthy stocks across multiple dimensions.

4. Lack of Visual Storytelling

Problem:
The early dashboard versions felt more like data dumps rather than insightful narratives.

Solution:
I applied storytelling principles:

- Started each sheet with a question like “Which sector is most profitable?”
- Added titles, captions, and callout boxes
- Used **consistent colour schemes** and **layout flow**

  Outcome: The dashboard became more engaging and guided the user through insights rather than overwhelming them with numbers.

3. Skills Learned

During my internship CSRBOX I had the opportunity to develop a range of technical and professional skills. This section delves into the specific skills I acquired, how I learned them, and the impact they had on my personal and professional growth.

3.1 About the Skill/s

1. Excel – Data Cleaning & Ratio Calculation

- Used formulas like IF, VLOOKUP, and ROUND to clean and organize raw stock market data.
- Calculated key financial metrics such as **Profit Margin**, **P/E Ratio**, **ROE**, and **Dividend Yield**.

2. Tableau – Dashboard Design & Interactivity

- Built visual dashboards using **bar charts**, **scatter plots**, **heatmaps**, and **filters**.
- Applied **parameters** and **calculated fields** to enhance user interaction and insights.

3. Financial Analysis Skills

- Understood how metrics like P/E, ROE, and Promoter Holding impact stock evaluation.
- Learned to compare companies across sectors using multiple indicators.

4. Data Storytelling & Visual Communication

- Organized dashboards in a way that tells a clear story from raw data to decisionmaking.
- Focused on readability, user engagement, and meaningful insights.

5. Analytical Thinking & Problem-Solving

- Solved real-world issues like data inconsistency and dashboard clutter.
- Improved decision-making on what to show, how to show it, and why it matters.

3.2 How I Learned the Skill/s

- **Hands-On Learning Approach:**
  I worked directly with real-world NIFTY50 financial data, using Excel to clean, format, and calculate key ratios such as Profit Margin, ROE, and P/E Ratio. This practical exposure helped me better understand data structuring for analysis.

- **Mastering Tableau through Practice:**
  I learned Tableau by building dashboards from scratch — creating charts, experimenting with filters and parameters, and designing interactive layouts. I practiced by uploading datasets repeatedly and testing different visual styles.

- **Application of Market Knowledge:**
  My prior trading and investing experience helped me decide what metrics matter most and how they should be compared visually. This gave me an edge in creating dashboards that align with how real analysts interpret financial data.

- **Data Storytelling Skills:**
  I learned to design visuals that do more than display numbers — they tell a story. I structured dashboards with a logical flow, added insights, and used visual hierarchy to guide users through profitability, valuation, and ownership metrics.

- **Iterative Feedback & Refinement:**
  I improved my work through trial-and-error and feedback. I revised chart types, simplified views, and added features like filters and sector breakdowns to make the dashboard more useful and user-friendly.

4. Overall Experience

4.1 Technical Experience

During my internship, I worked on the project titled **"Quantitative Analysis of NIFTY50 Constituents,"** where I combined my knowledge of the stock market with hands-on use of **Excel** and **Tableau**. I learned to clean, calculate, and organize large volumes of real financial data using Excel, applying formulas to derive meaningful metrics like P/E Ratio, ROE, Profit Margin, and Promoter Holding. Using Tableau, I built a multi-layered dashboard with interactive charts, sector filters, and visual summaries to compare performance across top 50 NSE-listed companies.

I also gained experience in **data visualization best practices**, storytelling through charts, and improving dashboard interactivity for real-world users such as investors and analysts. Every stage—from dataset preparation to layout design and final presentation—allowed me to understand how financial data can be transformed into practical, visual decision-making tools. The technical skills I gained are directly applicable in the fields of **financial analytics, data science, and BI (Business Intelligence).**

4.2 Personal Experience

This internship helped me grow not only as a technical learner but also as a professional. While working with CSRBOX, I observed how real-world CSR initiatives are tracked, visualized, and communicated using data. I experienced how impact reporting, sector mapping, and SDG alignment are essential for companies today. The organizational environment was collaborative and knowledge-driven, which motivated me to take ownership of my work and contribute meaningfully.

The project also improved my **time management, research discipline, and design sense**—as I iterated through multiple dashboard versions based on feedback and testing. I gained confidence in presenting my work visually and explaining the business value behind each insight. Interacting with real datasets and aligning them to investor use-cases made me realize the true importance of accuracy, relevance, and user-cantered design.

4.3 Personal Growth and Reflection

This project was not just about building a dashboard — it was about growing personally and professionally. Working on real financial data and transforming it into visual insights taught me the value of **discipline, curiosity, and continuous learning**. I became more confident in presenting data-driven stories and explaining financial metrics in a simple, impactful way.

Throughout the internship, I improved my ability to manage time, adapt to feedback, and solve problems independently. I learned how to approach a large project step-by-step — from research and data collection to design and analysis — and how to align my output with realworld user needs.

5. Conclusion

This internship project allowed me to apply my stock market knowledge to realworld data analytics using tools like **Excel** and **Tableau**. I successfully built an interactive dashboard that presents key financial metrics of NIFTY50 companies, helping users make better comparisons and data-driven investment decisions.

The project improved my skills in data cleaning, visualization, and storytelling, while also enhancing my problem-solving and independent working abilities. Overall, this experience deepened my understanding of how technology and finance come together to create valuable insights, and it has inspired me to further explore opportunities in **financial analytics, dashboard development, and business intelligence**.

5.1 Summary of Key Learnings

During this internship project, I gained both technical and professional skills that are directly applicable to the field of **financial analytics and data visualization**.

- **Excel Mastery:**
  I learned to clean datasets, organize stock market data, and calculate financial metrics such as ROE, P/E Ratio, and Profit Margin using formulas and functions.
- **Tableau Proficiency:**
  I developed skills in building interactive dashboards using filters, calculated fields, and various chart types to visually compare companies within the NIFTY50 index.
- **Data Storytelling:**
  I understood how to present financial data clearly and meaningfully to help users draw insights — converting complex numbers into easy-to-understand visuals.
- **Problem-Solving & Design Thinking:**
  I learned to identify and fix data issues, reduce visual clutter, and enhance dashboard usability through feedback and iterative design.
- **Real-World Financial Understanding:**
  By working with real company data, I strengthened my ability to interpret stock market indicators and link them to actual business performance.

This internship helped me connect my existing stock market knowledge with practical tools, preparing me for future roles in **finance, analytics, and technology-driven decisionmaking**.

5.2 Future Directions

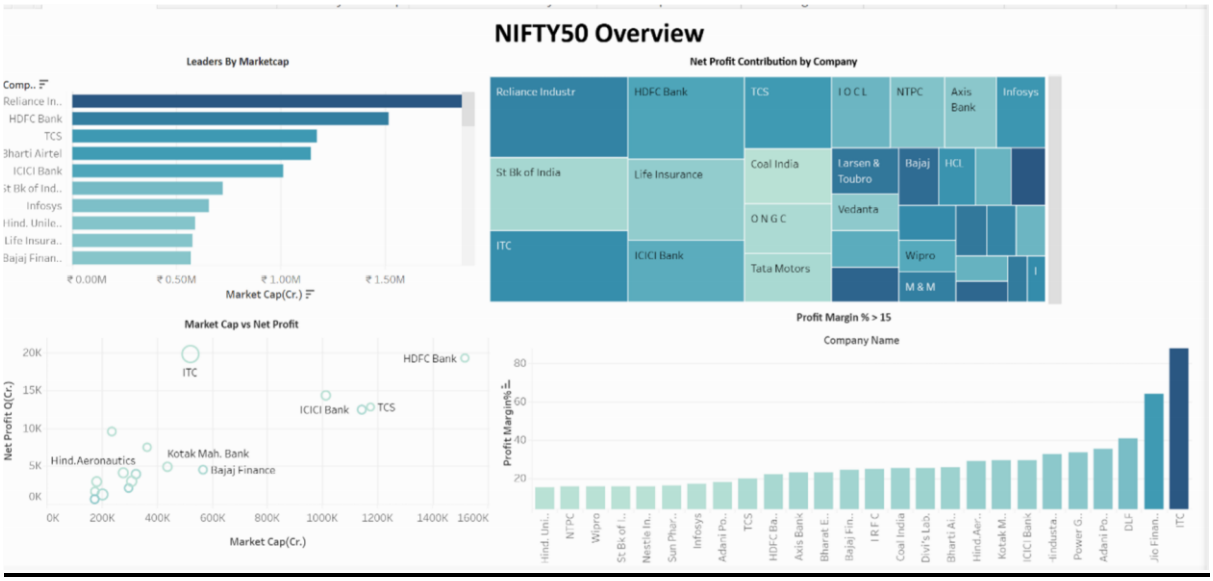
This project has laid a strong foundation for further exploration in the fields of **financial analytics, stock market research, and business intelligence**. In the future, I plan to:

- **Expand the Dashboard** to include other indices like **NIFTY Next 50** or **sectoral indices** for broader market coverage.
- **Integrate Predictive Analytics** by adding forecasting models (e.g., using Python or Power BI) to project future stock trends or financial ratios.
- **Include ESG & CSR Metrics** to analyse companies not just by profit but by their environmental and social performance.
- **Automate Data Collection** using APIs (like Yahoo Finance or NSE India) to keep the dashboard updated in real time.
- **Build a Personal Stock Screener** using filters like valuation, growth, and ownership to support smarter investment decisions.

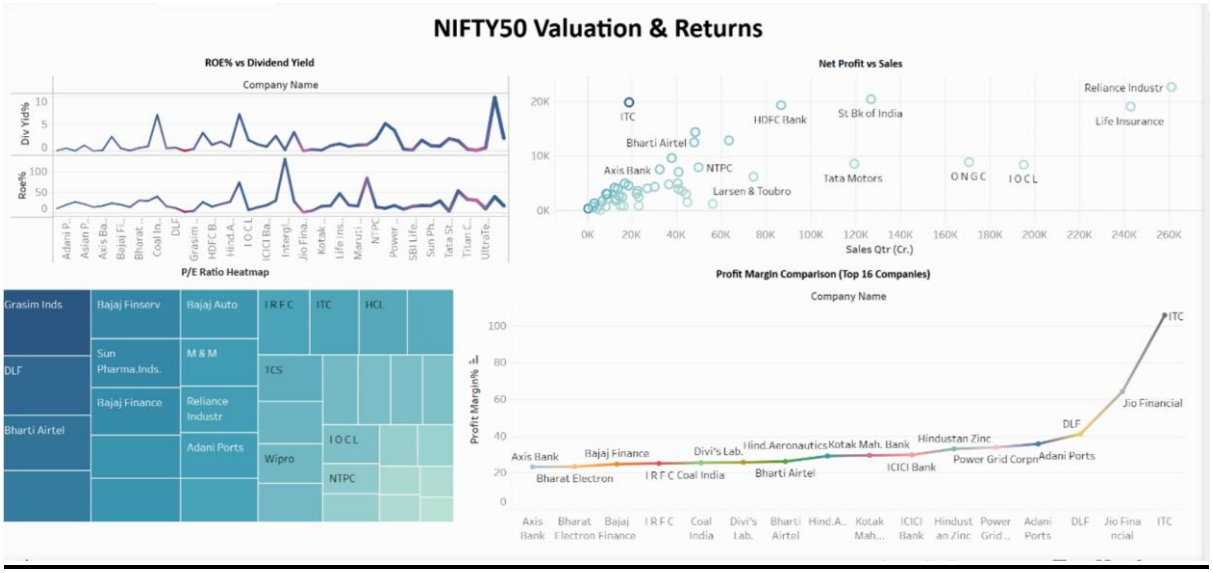
5.3 Final Thoughts

Working on the project titled **"Quantitative Analysis of NIFTY50 Constituents"** during my internship at **CSRBOX** allowed me to practically apply my stock market knowledge using tools like Excel and Tableau. I learned how to convert complex financial data into visual insights through dashboards that are useful for investors and analysts. This experience strengthened my skills in data analysis, visualization, and problem-solving, and has encouraged me to further explore opportunities in data-driven financial research.

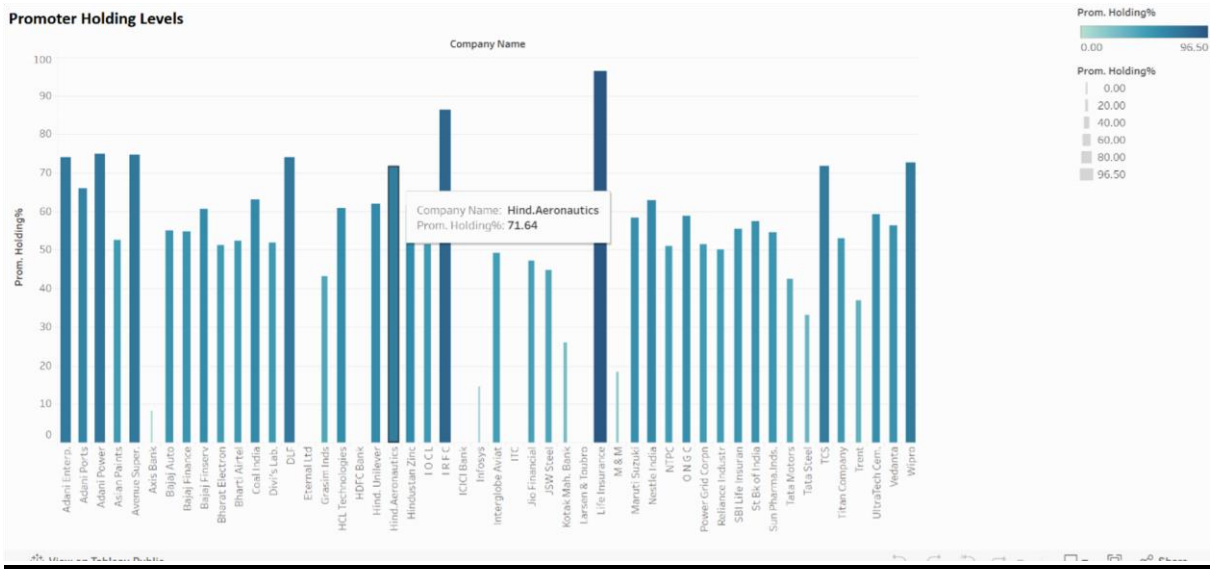
6. Dashboard



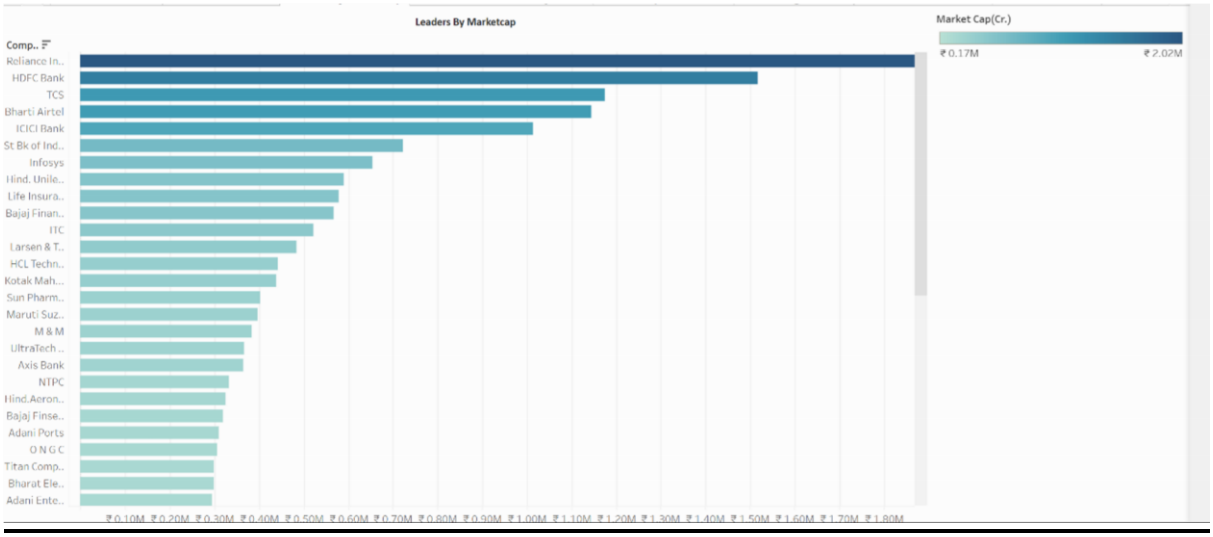
6.1 NIFTY 50 Companies Overview



6.2 NIFTY50 Valuation & Returns

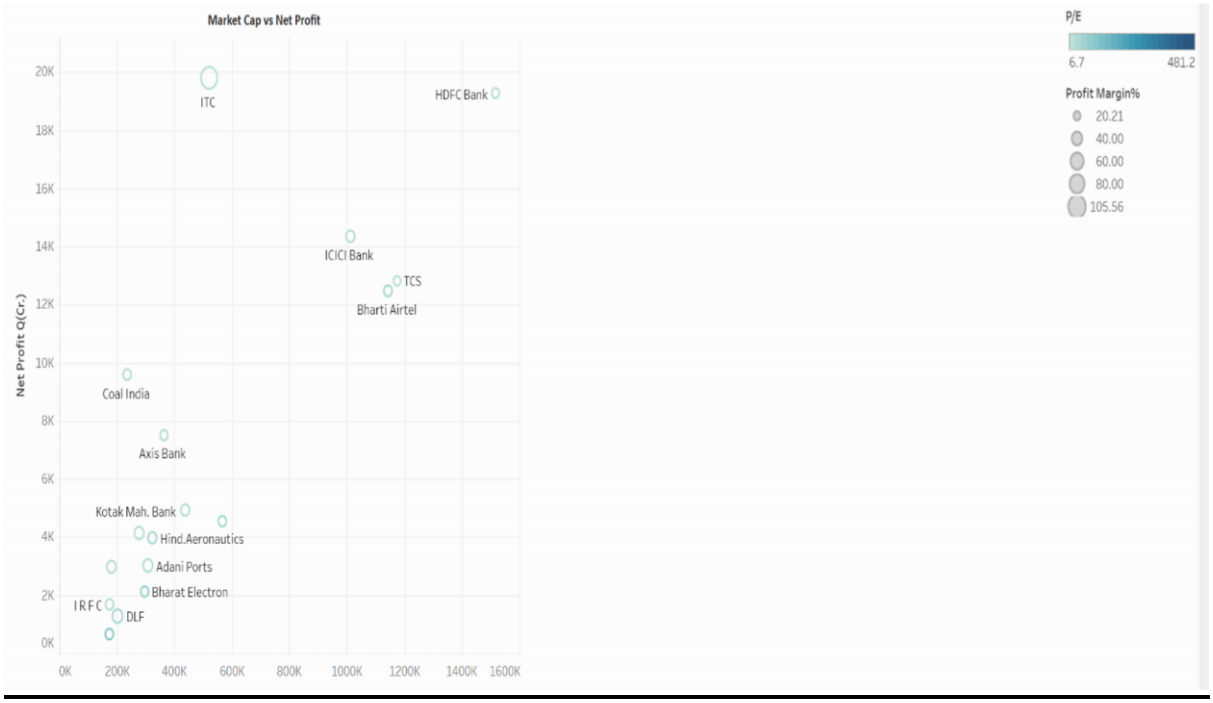


6.3 Promoter Holdings In Companies

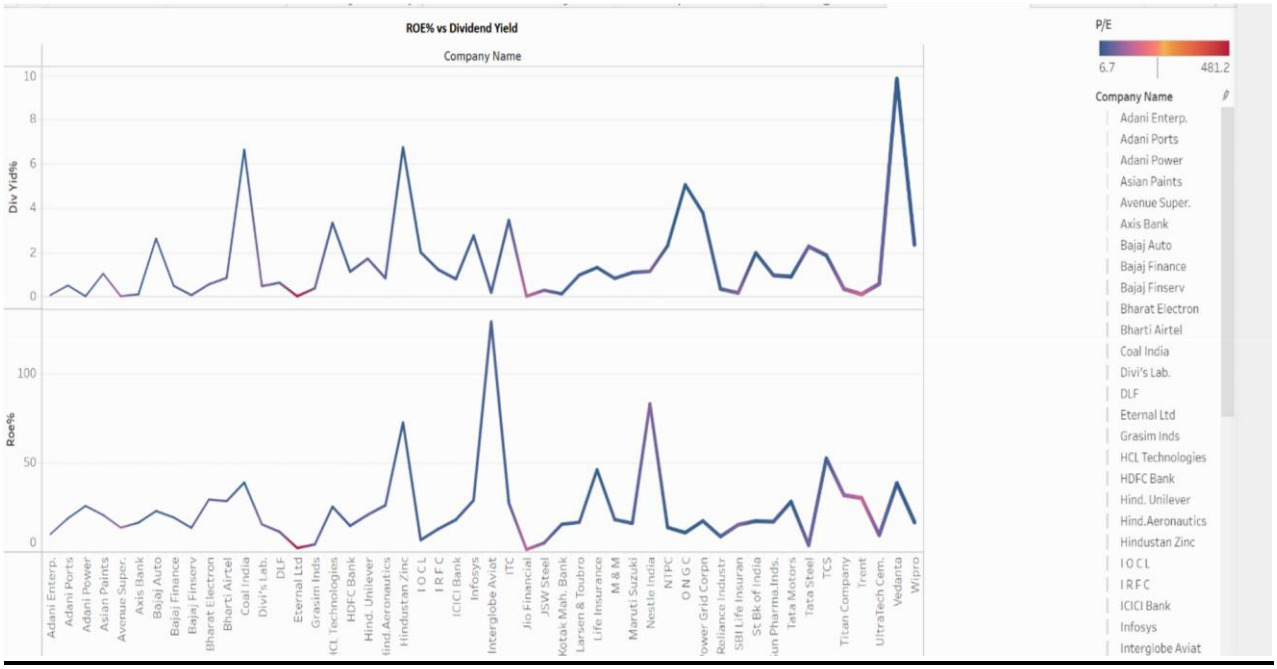


6.4 Leaders By Market Cap

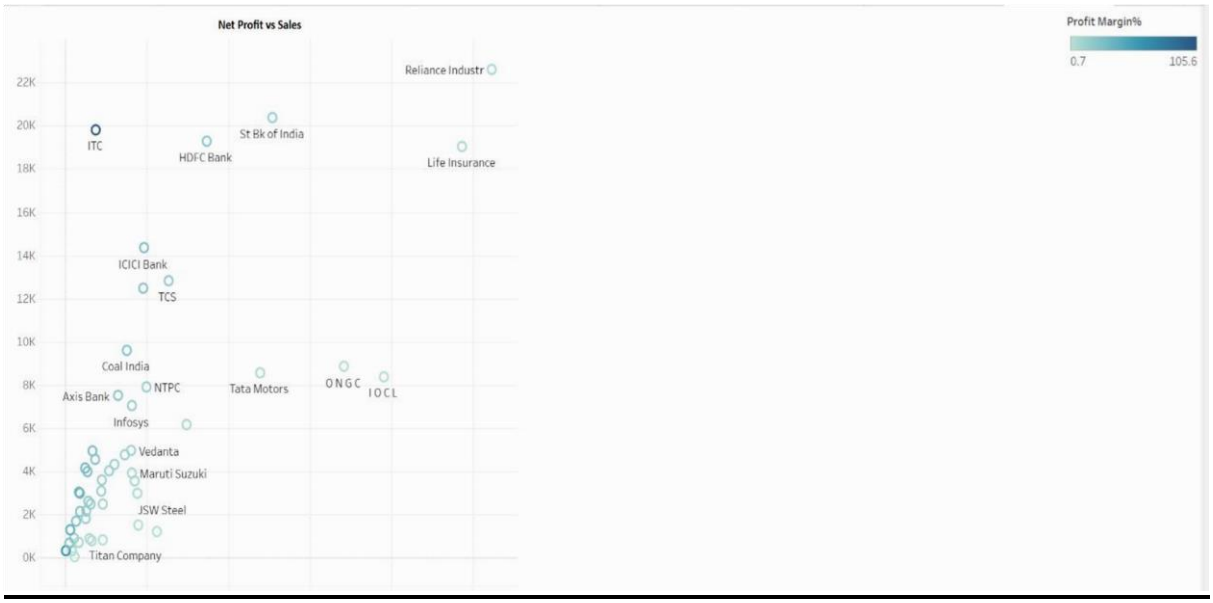
6.5 Net Profit Contribution By Company



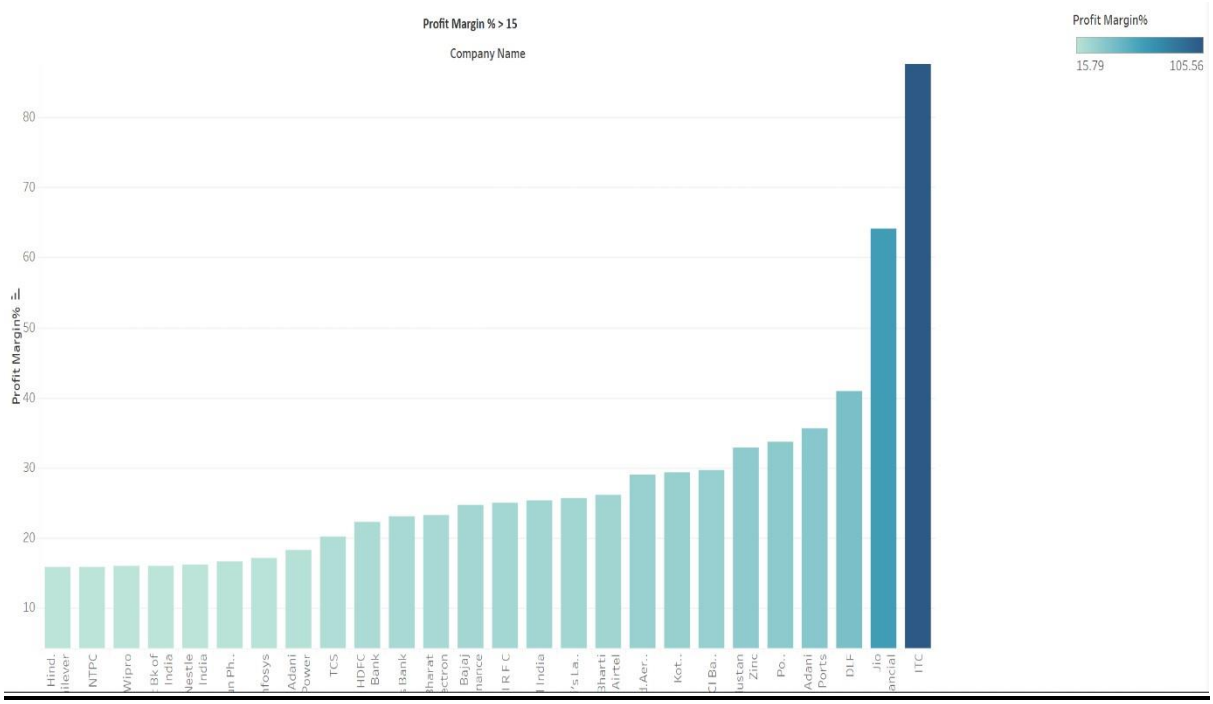
6.6 Market Cap vs Net Profit



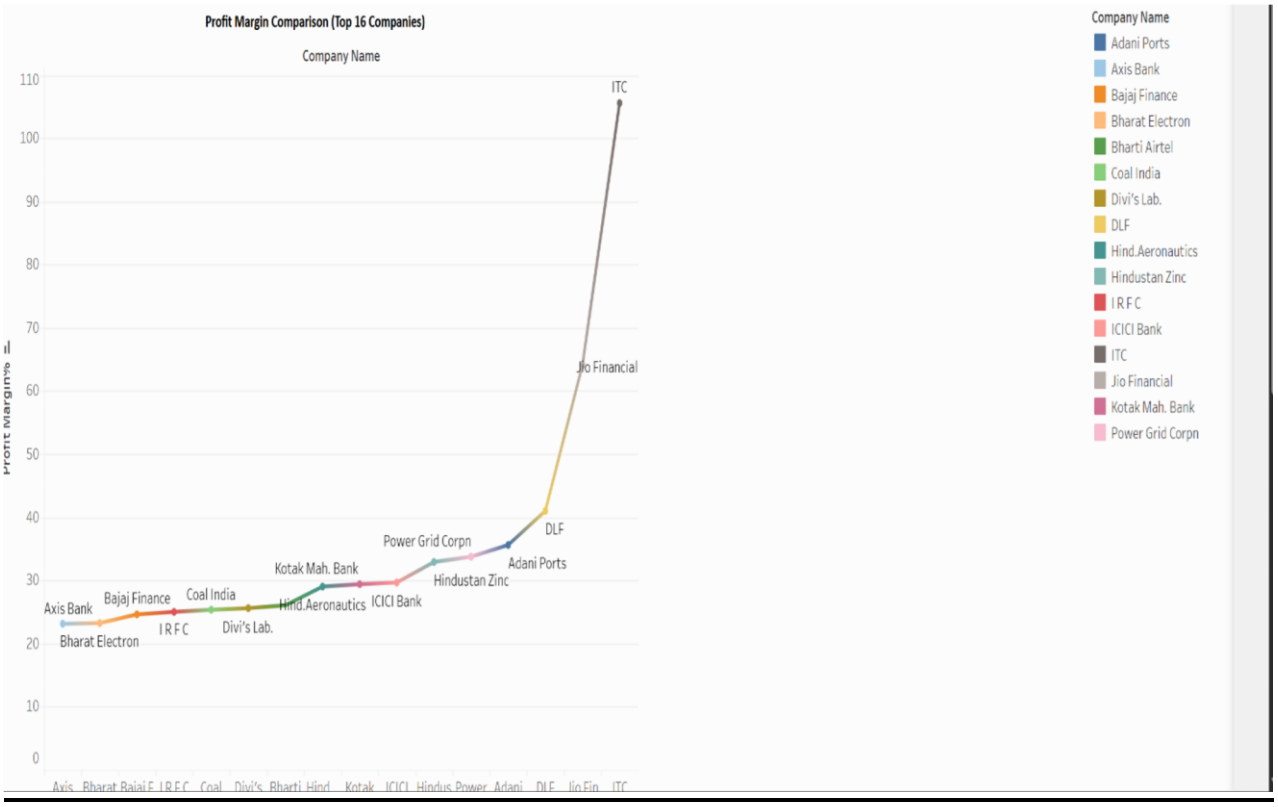
6.7 ROE% vs Dividend Yield%



6.8 Net Profit vs Sales



6.9 Profit Margin > 15



6.10 Top 16 Highest Profit Margin Companies

7. Reference

7.1 Reference

1. **National Stock Exchange (NSE India)** – https://www.nseindia.com
2. **CSRBOX Platform** – https://csrbox.org
3. **Screener.in** – https://www.screener.in
4. **Tableau Public** – https://public.tableau.com
5. **Microsoft Excel Official Guide** – https://support.microsoft.com/excel

6. **Project link –**

   https://public.tableau.com/views/FinanceAnalyticsDashboard_17523877582630/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link