# Excel Analytics Platform

## A PROJECT REPORT

*Submitted by*

**Divyanshu .M. Patel**

**220090116041**

*In partial fulfillment for the award of the degree of*

# BACHELOR OF ENGINEERING

*in*

**Information Technology**

**C. K. Pithawala College of Engineering and Technology, Surat**

**Gujarat Technological University, Ahmadabad**

**August, 2025**

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# CERTIFICATE

*This is to certify that the project report submitted along with the project entitled **Excel Analytics Platform** has been carried out by **Divyanshu .M. Patel** under my guidance in partial fulfillment for the degree of Bachelor of Engineering in Information Technology, 7th Semester of Gujarat Technological University, Ahmedabad during the academic year 2025-26.*

**Prof. Priyanka Afini**
Internal Guide

**Dr. Ami Choksi**
Head of the Department

**ZIDIO**
DEVELOPMENT

Issue Date : 09/06/2025
Employee ID: zida1IzBBM

# Zidio Internship

OFFER LETTER

**Internship Start Date: 15-06-2025**
**Internship End Date: 15-07-2025**

Dear Divyanshu Maheshbhai Patel,

We are pleased to extend this offer to you for the position of **Web Developer Intern** at **Zidio Development**, a rapidly growing product-based software development company dedicated to advancing in the age of AI through learning and development. The internship opportunity has been thoughtfully designed to provide you with hands-on exposure to real-world projects, mentorship from experienced professionals, and structured learning that aligns with your academic and career aspirations. Your selection is a reflection of your potential, and we are confident that your contributions will be valuable to our ongoing initiatives.

At Zidio Development, we foster a culture of innovation, collaboration, and continuous growth. As part of our dynamic team, you will have the opportunity to work on impactful assignments and develop practical skills in your chosen domain. We believe this internship will be a significant step in your professional journey, and we look forward to your active participation and commitment.

**Internship Details**
– **Internship Role:** Web Developer Intern
– **Working Hours:** As per the Company Policy
– **Duration:** 1 Month
– **Shift:** Mon-Fri
– **Training Timing:** Evening
– **Project Timing:** Flexible
– **Holidays:** The company will remain closed on public holidays.
– **Stipend:** Your stipend will be up to INR 12000/Month for the internship period.

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📞 +918455897965      🌐 www.zidio.in      📍 Bengaluru,Karnataka,India

5. On completion of your internship you will be required to submit a copy of your project report, which will be the sole property of Zidio Development.

6. You shall not undertake any internship in parallel with this internship.

7. In the event of any misconduct or breach of terms of this internship on the part of the Intern during the internship period, Zidio Development reserves the right to terminate internship without any notice.

8. This offer of Internship will be governed as per the Laws of India.

Please confirm your acceptance of this offer using the offer acceptance link provided in your mail within the assigned deadline else the offer will be revoked and will be automatically considered to be cancelled.

We are excited to welcome you to the Zidio family and look forward to a productive and enriching internship period together.

**Executive Director**
Mr. Shakti Prasad

**HR Manager**
Ms. Rashmi Samal

**Team Lead**
Mr. Deepan Kumar

**Acknowledgement and Acceptance**

I, _____ acknowledge and accept the terms and conditions outlined in this offer letter.
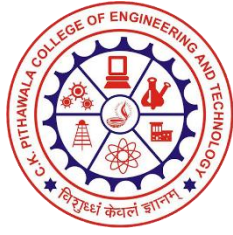
Name: _____

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# DECLARATION

I hereby declare that the Internship report submitted along with the Internship / Project entitled **Excel Analytics Platform** submitted in partial fulfillment for the degree of Bachelor of Engineering in Information Technology to Gujarat Technological University, Ahmedabad, is a bonafide record of original project work carried out by me at **Zidio Development** under the supervision of **Ms.Radhika Kasat, Mentor Zidio Development** and **Prof. Priyanka Afini, Department of Information Technology, C.K. Pithawala College of Engineering and Technology**, that no part of this report has been directly copied from any students' reports or taken from any other source, without providing due reference.

**Divyanshu .M. Patel**
220090116041

# Acknowledgement

I would like to take this opportunity to sincerely thank Zidio Development for giving me the chance to do my internship in the field of Web Development. Working here has been a great learning experience and has helped me understand how MERN projects are developed and implemented in real life.

My heartfelt thanks to my external guide, Radhika Kasat, for his constant guidance, patience, and encouragement throughout the project. I am equally grateful to my internal guide, Prof. Priyanka Afini, from the Department of Information Technology, C.K. Pithawala College of Engineering and Technology, for the support, suggestions, and motivation that helped me complete my work successfully.

I would also like to thank all the members of the Zidio Development team for making me feel welcome and for sharing their knowledge so openly.

Divyanshu .M. Patel

# Abstract

This project, titled **"Excel Analytics Visualization in MERN Stack,"** was developed during my internship at Zidio Infotech in the field of Full Stack Development.The aim of this project was to design an interactive web application that enables users to upload Excel files, analyze datasets, and visualize results through dynamic charts and summaries.

The system is built using the **MERN (MongoDB, Express.js, React.js, Node.js) stack**, integrated with libraries such as **XLSX.js for Excel parsing**, **Chart.js for visualization**, and **AI-powered summarization** for insights. Users can seamlessly upload data, view graphical trends like bar, line, and pie charts, and download reports in PDF/PNG format for further use. Authentication and role-based access were also implemented to ensure secure and personalized usage.

This project not only highlights the power of the MERN stack in handling data-driven applications but also demonstrates how automation and visualization can simplify decision-making.

Through this internship, I gained valuable skills in **full-stack web development, API integration, data visualization, and system deployment**.

Full Stack Development

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## List of Symbols, Abbreviations and Nomenclature

**SEO**          Search Engine Optimization

**IoT**          Internet of Things

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Full Stack Development

# 1 OVERVIEW OF THE COMPANY

## 1.1 History

History of company
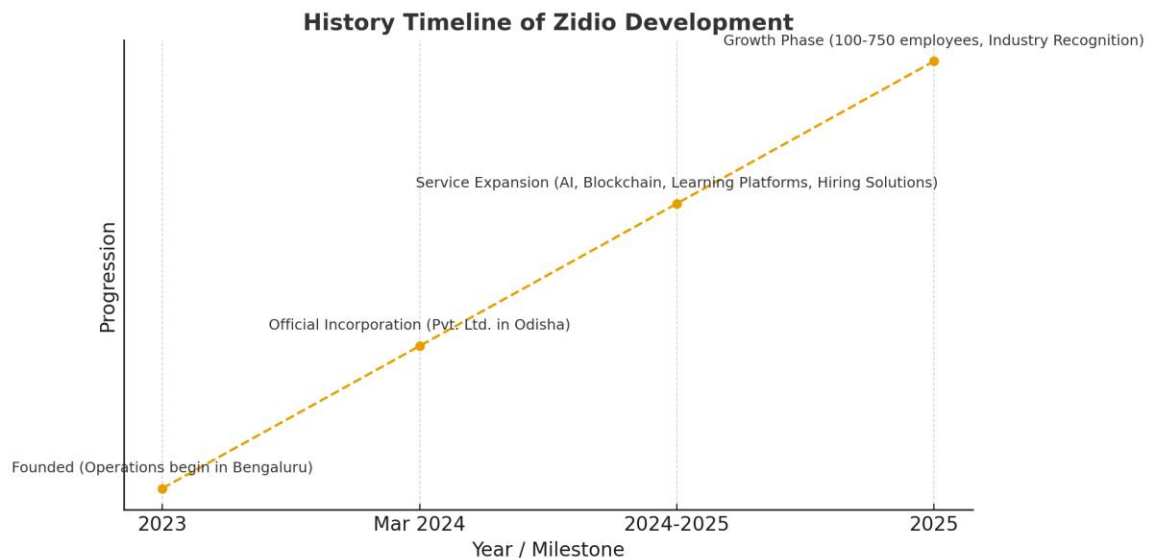


*Figure 1 History of Company*

Zidio Development, officially registered as Zidio Development Private Limited in March 2024, was founded in 2023 with a mission to deliver innovative digital solutions. Focused on AI, machine learning, blockchain, and cloud technologies, the company has expanded into software development, mobile apps, and workflow automation. With its commitment to quality and user-centric design, Zidio continues to grow as a trusted technology partner for modern businesses.

## 1.2 Different product / scope of work

Scope of work for company.

| Service / Product | Description | Technologies / Tools Used |
|---|---|---|
| Web Development | Building responsive, scalable, and user-friendly websites for businesses. | HTML, CSS, JavaScript, React.js, Node.js, Express.js, MongoDB |
| Mobile Applications | Developing cross-platform and native mobile apps tailored to client needs. | Flutter, React Native, Android (Java/Kotlin), iOS (Swift) |
| Artificial Intelligence | Implementing AI models for automation, analytics, and decision-making. | Python, TensorFlow, PyTorch, OpenAI APIs, NLP frameworks |
| Blockchain Solutions | Creating secure blockchain-based apps and decentralized platforms (DApps). | Ethereum, Solidity, Web3.js, Hyperledger |
| Workflow Automation | Automating business processes to improve efficiency and productivity. | n8n, Zapier, APIs, Node.js |
| Cloud Solutions | Offering cloud integration, hosting, and scalable deployment services. | AWS, Google Cloud, Microsoft Azure, Docker, Kubernetes |
| Hiring & Job Portals | Designing recruitment platforms for job seekers and employers. | MERN Stack, PostgreSQL, REST APIs, Authentication Tools |

*Table 1 Scope of Work*

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## 1.3 Organization chart.

Organization chart of the company.

**Organization Chart of Zidio Development**
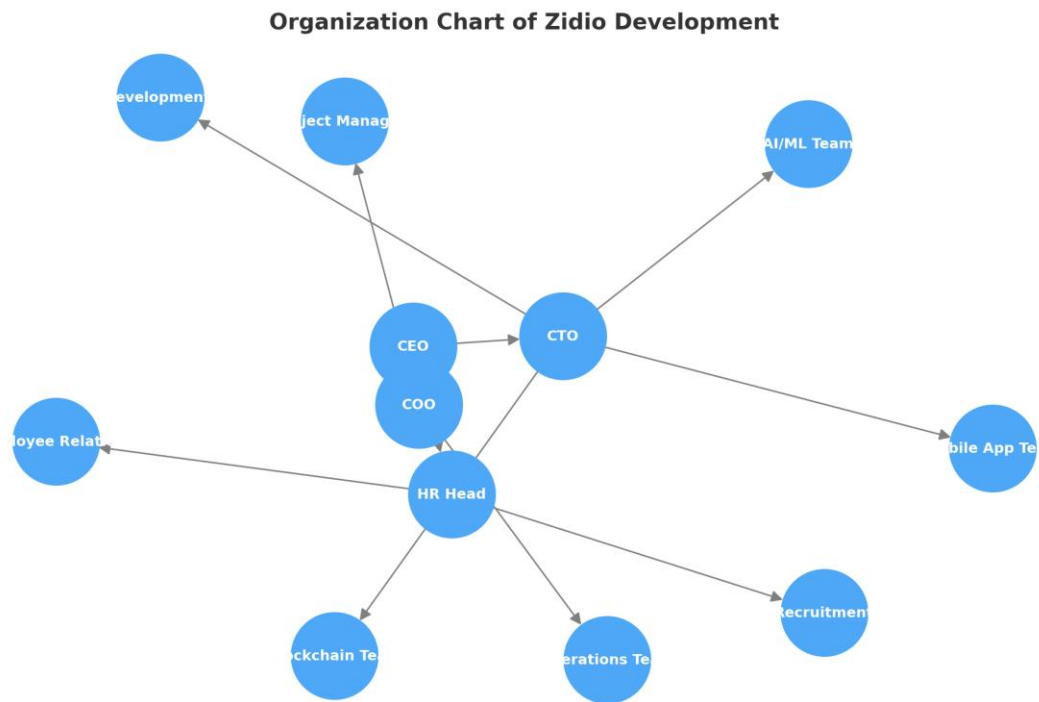


*Figure 2 Organization Chart*

## 1.4 Capacity of plant

Infrastructure details of the company

| Infrastructure Component | Capacity | Description |
|---|---|---|
| Web Development | Scalable to 50+ Projects | HTML, CSS, JavaScript, React.js, Node.js, Express.js, MongoDB |
| Mobile Applications | 30+ Active Test Devices | Flutter, React Native, Android (Java/Kotlin), iOS (Swift) |

Full Stack Development

| | | |
|---|---|---|
| Operations Tools | Automated Monitoring | Ensures workflow tracking & issue management |
| HR Management System | 1000+ Active Profiles | Manages recruitment, onboarding & performance |
| Blockchain Nodes | 15+ Private Nodes | supports smart contracts & decentralized apps |
| HR Management System | 1000+ Active Profiles | Manages recruitment, onboarding & performance |

*Table 2 Plant Capacity*

## 2 COMPANY OVERVIEW

**Zidio Development** is a technology-driven organization specializing in AI/ML, Web Development, Mobile Applications, Blockchain solutions, and enterprise operations. With a strong focus on innovation and scalability, Zidio provides advanced training, real-time virtual labs, and cloud-based solutions to empower businesses and interns alike. The company is committed to delivering cutting-edge digital products while fostering talent through structured learning and development programs.

### 2.1 Department working

**AI & Machine Learning Department** – Builds intelligent models and data-driven solutions for predictive analytics, automation, and decision-making.

**Blockchain Development Unit** – Develops decentralized applications, secure smart contracts, and scalable blockchain infrastructures.

**Cloud & Infrastructure Team** – Manages servers, deployments, and scalable environments with high availability and reliability.

**UI/UX & Design Studio** – Crafts intuitive interfaces and engaging digital experiences aligned with client needs.

**Operations & Support Division** – Ensures smooth workflows, resource allocation, and technical support for ongoing projects.

**Human Resources & Training Wing** – Handles talent acquisition, professional growth, and structured internship programs.

Full Stack Development

## 2.2 Technical specifications

| Department | Major Tools / Technologies Used |
|---|---|
| Web Development | HTML, CSS, JavaScript, React, PHP, WordPress |
| Mobile App Development | Flutter, React Native, Kotlin, Swift, Firebase |
| Blockchain Development | Solidity, Etharium, Hyperledger, truffle |
| Product Management | Agile/Scrum, Jira, Trello, Slack, Confluence |
| Website Maintenance | CMS tools, Security Plugins SEO tools |

## 2.3 Sequence of operations

**Requirement Analysis & Planning** – Gather client needs, define scope, and create roadmap.

**Design & Prototyping** – Build wireframes, UI/UX flow, and validate with stakeholders.

**Development** – Implement solutions using Agile sprints across web, mobile, AI.

**Testing & QA** – Ensure functionality, performance, and security through rigorous testing.

**Deployment** – Launch on servers or app stores with scalability and security.

**Maintenance & Support** – Provide updates, bug fixes, and ongoing customer support.

## 2.4 Production Stages

1. **Ideation & Requirement Gathering** – Collect client needs, analyze market trends, and define objectives.

2. **Planning & Resource Allocation** – Create timelines, assign teams, and set milestones.

3. **Design & Prototyping** – Develop UI/UX wireframes, prototypes, and workflows for validation.

4. **Development & Integration** – Build core functionalities, integrate APIs, and ensure modular coding.

5. **Testing & Quality Assurance** – Conduct functional, performance, and security testing to ensure reliability.

6. **Deployment** – Release the product to live environments or app stores with monitoring enabled.

7. **Maintenance & Upgrades** – Provide updates, fix issues, enhance performance, and add new features.

# 3 INTRODUCTION TO INTERNSHIP

This internship at **Zidio Development** was focused on **Full Stack Web Development using the MERN Stack (MongoDB, Express.js, React, Node.js)**. The primary project, **Excel Analytics Visualization**, aimed to build a web platform that allows users to upload Excel files, analyze data, and generate dynamic visualizations. The report outlines the **project summary, purpose, objectives, scope, technical background, planning, cost estimation, defined roles, group dependencies, and project scheduling**.

## 3.1 Project / Internship Summary

The internship project, **Excel Analytics Visualization**, focused on developing a web-based platform using the **MERN Stack (MongoDB, Express.js, React, Node.js)**. The application enables users to upload Excel files, process datasets, and generate interactive visualizations such as bar charts, pie charts, and line graphs. It also integrates AI-driven summaries to provide insights like averages, trends, and category distributions.

The project was designed to give hands-on experience in **full-stack development**, combining **frontend React interfaces**, **backend APIs with Node.js & Express.js**, and **MongoDB for data storage**, while also implementing features like **user authentication, file management, and PDF/PNG export of charts**. This provided a comprehensive exposure to real-world development workflows and industry-standard practices.

## 3.2 Purpose

The purpose of the **Excel Analytics Visualization** project is to create a user-friendly platform that allows individuals and organizations to easily interpret Excel data. By transforming raw spreadsheets into **interactive charts, graphs, and summaries**, the system helps users make data-driven decisions without requiring advanced technical knowledge. It bridges the gap between traditional data entry tools and modern visualization solutions.

## 3.3 Objective

- To enable **Excel file upload and storage** in a secure web application.
- To provide **interactive data visualizations** (bar, pie, line charts, etc.) for quick insights.
- To generate **AI-powered summaries**, including averages, highest/lowest values, and category counts.
- To support **export of charts and summaries** as PDF/PNG in a professional format.
- To integrate **user authentication** and role-based access for secure usage.
- To ensure **scalability and performance** using the MERN stack and cloud deployment.

## 3.4 Scope

**In Scope (What it can do):**

- Upload Excel files and parse data in real time.
- Visualize datasets with customizable chart types.
- Generate AI-assisted text summaries of data trends.
- Allow users to download results in clean report format (PDF/PNG).
- Maintain history of uploaded files for future reference.

**Out of Scope (What it can't do):**

- Process extremely large enterprise-scale datasets beyond defined limits.
- Replace advanced Business Intelligence (BI) platforms like Power BI or Tableau.
- Provide offline analytics without internet connectivity.

## 3.5 Technology

- **Frontend:** React.js, Tailwind CSS, Redux

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- **Backend:** Node js , Express js
- **Database:** MongoDB (NoSQL, scalable storage)
- **Tools & Platforms:** GitHub, Postman, Docker, Render/Heroku, AWS
- **References:** MERN Stack documentation, Zidio's internal project guidelines, research papers on scalable web architecture.

## 3.6 Project / Internship Planning

### 3.6.1 Approach with Justification

The **Agile methodology** was adopted, using **Scrum** with weekly sprints. This approach allowed incremental development, frequent client feedback, and flexibility to accommodate changes.

### 3.6.2 Cost Estimation

- **Effort:** 12 weeks internship (approx. 240 hours).
- **Tools/Software:** Mostly open-source (React, Node.js, MongoDB).
- **Deployment Costs:** Minimal (cloud hosting ~ $10–15/month).
- **Human Resource Cost:** Internship training under mentorship.

### 3.6.3 Roles

- **Intern (Self):** Full stack developer, handling frontend & backend modules.
- **Mentor:** Provided technical guidance and project review.
- **Team Members (if any):** Collaboration on version control, testing, and debugging.

### 3.6.4 Group Dependencies

- **Design Team:** UI/UX guidance.
- **DevOps Team:** Assistance with deployment.
- **Mentor/Project Manager:** Approval and feedback on deliverables.

## 3.7 Project / Internship Scheduling

| Phase | Duration | Tasks |
|-------|----------|-------|

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| Week 1: Planning & Setup | 5 Days | Requirement analysis, MERN environment setup, GitHub repo creation, and database schema design. |
|---|---|---|
| Week 2: Frontend Development | 5 Days | React components, file upload UI, chart visualization (Bar, Pie, Line) using Chart.js. |
| Week 3: Backend Development | 5 Days | Node.js & Express APIs, Excel parsing, MongoDB integration, authentication & role-based access. |
| Week 4: Testing & Deployment | 5 Days | Functional testing, AI summary integration, PDF/PNG export, final deployment to cloud (Render/AWS). |

# 4 SYSTEM ANALYSIS

## 4.1 Study of Current System

In many organizations and academic environments, **Excel spreadsheets** are used as the primary tool for storing, processing, and analyzing data. While Excel is widely accessible, it becomes inefficient when dealing with large datasets or when visualization and automated analysis are required. Users often face difficulty in extracting insights, generating professional reports, or sharing results across teams.

## 4.2 Problem and Weaknesses of Current System

- Manual data entry and analysis is **time-consuming and error-prone**.
- Limited visualization options make it difficult to derive meaningful insights.
- No automated **AI-based summary or insights** are generated.
- Collaboration and sharing of insights require external tools.
- Exporting data into clean, professional formats is challenging.
- Difficult to **track historical datasets** uploaded by users.

## 4.3 Requirements of New System

The new system should:

- Provide **automated Excel file upload and parsing**.
- Offer **interactive visualizations** (bar, pie, line charts, etc.).
- Generate **AI-powered summaries** of datasets (averages, trends, distributions).
- Allow **export of results** in PDF/PNG formats.
- Store uploaded files in **MongoDB** for future access.
- Implement **secure user authentication** and role-based access.
- Ensure **scalability and cloud deployment** for reliability.

## 4.4 System Feasibility

### 4.4.1 Contribution to the objective.

Yes, the system directly contributes to Zidio Development's objective of delivering **innovative, data-driven web applications**. It simplifies Excel-based data analytics, providing value for both academic and business users.

### 4.4.2 Constraints

- **Technology Constraints:** Limited to MERN stack, Chart.js, and AI APIs.
- **Cost Constraints:** Uses mostly **open-source technologies**, with minimal hosting costs.
- **Schedule Constraints:** Internship duration limited to 4 weeks, requiring Agile-based rapid development.

### 4.4.3 Integration

The system can be integrated with:

- **Authentication systems** (JWT-based user login).
- **Cloud services** (AWS/Render) for deployment.
- Potential integration with **third-party AI/ML APIs** for advanced analytics.

## 4.5 Process Flow

**Proposed System Flow:**

1. User logs in to the system.
2. User uploads Excel file.
3. Backend (Node.js + Express) parses and stores data in MongoDB.
4. Frontend (React) generates visualizations using Chart.js.
5. AI module produces summary insights.
6. User can export charts and summaries as PDF/PNG.
7. Data is saved for future access and reporting.

## 4.6 Features

- Excel file upload & parsing.
- Dynamic data visualization (Bar, Pie, Line).
- AI-powered summaries and insights.
- Role-based authentication (Admin/User).
- Export results to PDF/PNG.
- Cloud-based deployment with high availability.
- Storage and retrieval of historical files.

## 4.7 Modules

1. **Authentication Module** – User registration, login, and access control.
2. **File Management Module** – Upload, store, and fetch Excel files.
3. **Data Visualization Module** – Generate charts with Chart.js.
4. **AI Summary Module** – Provide automated analysis and insights.
5. **Export Module** – Export charts and summaries into professional reports.
6. **Admin Module** – Manage users, files, and system performance.

## 4.8 Methodology

- **Hardware:** Standard development laptops with internet access; deployment on cloud servers (AWS/Render).
- **Software:** MERN Stack (MongoDB, Express.js, React.js, Node.js), Chart.js, AI/ML APIs, GitHub, Postman.
- **Algorithms/Techniques:**
    - Excel parsing using `xlsx` library.
    - Data visualization with **Chart.js**.
    - JWT-based authentication for security.
    - Agile methodology with weekly sprints.
- **Approach:** Agile-based incremental development, ensuring flexibility and rapid delivery.
- **Justification:** MERN stack and open-source libraries provide a **cost-effective, scalable, and modern solution** aligned with Zidio Development's technical.

# 5 SYSTEM DESIGN

## 5.1 System Design & Methodology

The **Excel Analytics Visualization system** follows a **three-tier architecture**:

1. **Frontend (React.js)** – Provides user-friendly interfaces for file upload, chart visualization, and report generation.
2. **Backend (Node.js + Express.js)** – Handles business logic, API requests, file parsing, and communication with the database.
3. **Database (MongoDB)** – Stores user information, uploaded file records, and processed data.

**Methodology:**
 The project used an **Agile development methodology** with weekly sprints, continuous feedback, and iterative improvement. Each sprint focused on specific modules (upload, visualization, AI summary, export, etc.), ensuring modular development and flexibility.

## 5.2 Design Details

### Database Design

- **Users Collection:** Stores user details (name, email, password hash, role).
- **Files Collection:** Stores file metadata (filename, upload date, user ID, status).
- **Data Collection (optional):** Stores processed datasets for quick access and visualization.

### Process Design

- User logs in → uploads Excel file.
- Backend parses file → stores details in MongoDB.
- Visualization module creates charts using Chart.js.
- AI module generates text summary.
- User exports results (PDF/PNG).

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## 5.3 Interface Design

### Input Interfaces

- **Login/Register Page** – User authentication.
- **Excel Upload Form** – Select and upload Excel files.
- **Chart Selection UI** – Choose visualization type (Bar, Pie, Line).

### Output Interfaces

- **Interactive Dashboard** – Displays uploaded files and generated visualizations.
- **AI Summary Section** – Shows key data insights.
- **Export Reports** – Download chart + summary in PDF/PNG format.

### 5.3.1 State Transition

**States:**

- Logged Out → Logged In → Uploading → Visualization Generated → Export Completed.

### 5.3.2 Forms and Reports

- **Forms:**
    - Login/Signup Form.
    - Excel Upload Form.
- **Reports:**
    - Exported **PDF/PNG Report** containing charts + data summary.

### 5.3.3 Security Considerations

**Authentication & Authorization:**

- JWT-based authentication for secure sessions.
- Role-based access (Admin/User).

**Data Security:**

- Passwords stored with hashing (bcrypt).

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● Uploaded files linked to specific users (access-controlled).

**Application Security:**

● Input validation to prevent malicious file uploads.
● HTTPS enabled for secure communication during deployment.

# 6 IMPLEMENTATIONS

## 6.1 Environment

The project was developed and tested in the following environment:

- **Operating System:** Windows 11 / Ubuntu (for deployment)
- **Development Environment:** VS Code, Postman, GitHub
- **Database:** MongoDB (Cloud – MongoDB Atlas)
- **Server Platform:** Node.js with Express.js
- **Frontend Framework:** React.js with Tailwind CSS
- **Charting Library:** Chart.js (via react-chartjs-2)
- **Export Tools:** jsPDF, html2canvas
- **Deployment:** Render (Backend), Vercel (Frontend)

## 6.2 Technology Specifications

| Module | Technology Used |
|---|---|
| Frontend | React.js, Tailwind CSS, Chart.js, html2canvas, jsPDF |
| Backend | Node.js, Express.js, Multer (for file upload), JWT (authentication), Bcrypt (hash) |
| Database | MongoDB Atlas (Cloud-based NoSQL database) |
| File Processing | XLSX (SheetJS) library for Excel parsing |
| Authentication & Security | JWT tokens, bcrypt hashing, role-based access control |
| Deployment | Render (Backend APIs), Vercel (Frontend hosting) |

## 6.3 Results

The system successfully met the internship project objectives:

- Users can **register/login securely** with role-based access (Admin/User).
- Users can **upload Excel files** and view previously uploaded files.
- System processes Excel data and generates **visual charts** (Bar, Pie, Line).
- The application provides **AI-generated insights** summarizing dataset trends.
- Users can **download reports** (charts + summaries) in **PDF/PNG formats**.
- Admin can manage user accounts and uploaded files efficiently.

## 6.4 Result Analysis

The developed system achieved the expected goals of **Excel Analytics Visualization** and provided a **functional, scalable, and user-friendly solution**.

- The **data visualization** was accurate and responsive across different devices.
- **Report export (PDF/PNG)** was formatted to fit A4 size, maintaining clarity and professionalism.
- Compared to traditional manual Excel analysis, the system significantly **reduced time and effort** by automating visualization and reporting.
- The **AI summary feature** added unique value by providing quick insights, improving decision-making.
- The system proved to be **scalable** (can handle multiple concurrent users) and **secure** (role-based access, data protection).

# 7 TESTING

## 7.1 Plan

The project followed **Black-Box** and **Integration Testing** approaches. Unit, integration, and functional tests verified core features like authentication, file upload, chart generation, and export. **Security tests** checked password hashing and role-based access, while **usability tests** ensured responsiveness and clarity. **Performance tests** validated stability with concurrent users. Overall, the goal was to confirm system reliability, accuracy, and scalability.

## 7.2 Test Results

Testing showed that the system performed as expected. All critical features (upload, visualization, export, authentication) worked properly with minor adjustments needed for edge cases (e.g., invalid Excel formats).

### 7.2.1 Test Cases

| Test Id | Test Condition | Expected Output | Actual Output | Remark |
|---------|----------------|-----------------|---------------|--------|
| T-01 | User register with valid details. | Account created successfully | Account created Successfully | Pass |
| T-02 | User Login with valid credentials. | Redirected to dashboard | Redirected to dashboard | Pass |
| T-03 | User login with incorrect credentials | Error message displayed | Error message displayed | Pass |
| T-04 | Upload valid Excel file | Data parsed, stored, and displayed as chart | Data parsed, stored, and displayed as chart | Pass |

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| T-05 | Generate chart from uploaded data | Chart rendered in selected format (Bar/Pie/Line) | Chart rendered in selected format (Bar/Pie/Line) | Pass |
|------|-----------------------------------|--------------------------------------------------|--------------------------------------------------|------|
| T-06 | Export chart as a pdf and png | Downloaded PDF/PNG with summary | Downloaded PDF/PNG with summary | Pass |
| T-07 | Admin promotes user to Admin | User role updated | User role updated | Pass |
| T-08 | Concurrent users uploading Excel file | System handles multiple requests without crash | Worked fine for 10+ concurrent test users | Pass |

# 8 CONCLUSION AND DISCUSSION

## 8.1 Overall Analysis

The internship at **Zidio Development** provided hands-on exposure to **Full Stack Development** using the MERN stack. The project, **Excel Analytics Visualization**, successfully delivered a platform that enables data upload, processing, and visualization through interactive charts. The system proved to be reliable, scalable, and user-friendly, aligning with organizational goals of creating practical and innovative digital solutions.

## 8.2 Problem and Solutions

- **Problem:** Handling large Excel files caused slower performance.
  **Solution:** Implemented streaming and optimized parsing using `xlsx` library.
- **Problem:** Ensuring secure user authentication and role-based access.
  **Solution:** Integrated JWT authentication and bcrypt-based password hashing.
- **Problem:** Chart rendering performance on big datasets.
  **Solution:** Used Chart.js optimization and limited data points where necessary.

## 8.3 Summary

The internship enhanced technical expertise in **MERN stack, API integration, authentication, and data visualization**. It also improved project planning, problem-solving, and teamwork skills. The project met its objectives by delivering a functional system that combines **Excel file handling, analytics, visualization, and report export (PDF/PNG)**.

## 8.4 Future Scope

Extend support for **CSV, JSON, and Google Sheets integration**.Implement **AI-powered insights** for predictive analytics and automated summaries. Enhance **collaboration features**, allowing multiple users to share and analyze datasets in real time. Improve **scalability** with cloud deployment (e.g., AWS, Azure, Docker, Kubernetes).

## REFERENCES

1. Ariponnammal, S. and Natarajan, S. (1994) 'Transport Phonomena of Sm Sel – X Asx', Pramana – Journal of Physics Vol.42, No.1, pp.421-425.

2. Barnard, R.W. and Kellogg, C. (1980) 'Applications of Convolution Operators to Problems in Univalent Function Theory', Michigan Mach, J., Vol.27, pp.81–94.

3. Shin, K.G. and Mckay, N.D. (1984) 'Open Loop Minimum Time Control of Mechanical Manipulations and its Applications', Proc.Amer.Contr.Conf., San Diego, CA, pp. 1231-1236.