Excel Analytics Platform: Project Report

A Minimum Viable Product for Secure Data Upload and Visualization

Prepared by: Excel Analytics Team

Date: July 21, 2025

Contents

1 Introduction **2**

2 Project Objectives **2**

3 Core Features **2**
- 3.1 Secure Login 2
- 3.2 Excel File Upload 2
- 3.3 Data Table Display 3
- 3.4 Interactive 2D and 3D Visualizations 3
- 3.5 Dark-Themed User Interface 3

4 User History Storage **3**

5 Technical Architecture **4**
- 5.1 Backend 4
- 5.2 Frontend 4

6 User Flow **4**

7 Future Potential **5**

8 Conclusion **5**

1 Introduction

The Excel Analytics Platform is a web-based application designed to provide users with a secure, intuitive, and visually appealing tool for uploading, analyzing, and visualizing Excel data. As a Minimum Viable Product (MVP), the platform focuses on delivering core functionality to enable users to log in securely, upload Excel files, view data in a tabular format, and generate interactive 2D and 3D visualizations. The application features a modern dark-themed user interface to enhance usability and aesthetics. Additionally, it supports individual history storage for up to five users, allowing each user to access their previously uploaded data and visualizations.

This report outlines the projects objectives, core features, technical architecture, user history functionality, and future potential, providing a comprehensive overview for stakeholders and developers.

2 Project Objectives

The primary goal of the Excel Analytics Platform MVP is to deliver a functional and user-friendly tool that meets the following objectives:

- **Security**: Provide secure user authentication to protect access to data and features.
- **Data Processing**: Enable seamless uploading and parsing of Excel files (.xls, .xlsx) for analysis.
- **Visualization**: Offer interactive 2D and 3D charts to help users gain insights from their data.
- **User Experience**: Implement a modern, dark-themed interface that is responsive and visually appealing.
- **User History**: Store individual data upload and visualization history for five users, ensuring personalized access to their data.

3 Core Features

The MVP includes five essential features that form the backbone of the platform, designed to deliver immediate value to users.

3.1 Secure Login

The platform requires users to log in with a username and password (e.g., `testuser`/`testpassword`) to access its features. Upon successful authentication, a JSON Web Token (JWT) is issued, ensuring secure session management. The login interface is presented in a centered card with a dark background and teal accents, providing a professional and intuitive user experience.

3.2 Excel File Upload

Users can upload Excel files (.xls or .xlsx) through a simple form. The backend validates the file type and parses the data into JSON format, storing it in a MongoDB database. The upload

form is styled with a dark theme and teal buttons, with clear feedback for successful or invalid uploads.

3.3 Data Table Display

Uploaded data is displayed in a responsive, scrollable table with column headers and rows. The table supports basic sorting by clicking headers and is styled with a dark background, grey borders, and white text for readability. This feature allows users to verify their data before visualization.

3.4 Interactive 2D and 3D Visualizations

Users can select columns from their data to generate visualizations:

- **2D Bar Chart**: Created using Chart.js, users choose an X-axis (e.g., categories) and a Y-axis (numeric values) via dropdowns. The chart is displayed in a dark-themed card with teal bars and includes a "Download as PDF" button.
- **3D Bar Chart**: Built with Three.js, this chart uses the same X and Y axes, offering interactive controls (rotate, zoom, pan). It is rendered in a dark card with cyan bars for visual consistency.

Dropdowns are styled with teal focus rings and are limited to numeric columns for the Y-axis, ensuring valid visualizations.

3.5 Dark-Themed User Interface

The platform features a cohesive dark theme with a background color of #1a202c, cards in #2d3748, white text in #e2e8f0, and teal accents in #4fd1c5. The UI is responsive, with centered content, rounded edges, subtle shadows, and hover effects on buttons, ensuring a modern and professional appearance across desktop and mobile devices.

4 User History Storage

The platform supports up to five users, each with individual history storage. Upon login, a users JWT identifies them, and their uploaded Excel files and selected visualization settings (e.g., chosen X and Y axes) are stored in MongoDB, associated with their user ID. This allows each user to:

- Access their previously uploaded files and data tables.
- View their saved 2D and 3D chart configurations.
- Resume analysis without re-uploading data.

The backend ensures data isolation, so each users history is private and accessible only during their authenticated session.

5 Technical Architecture

The MVP is built with a client-server architecture to ensure scalability and maintainability.

5.1 Backend

The backend is developed using:

- **Node.js and Express**: Handles API requests for login, file upload, and data retrieval.
- **MongoDB**: Stores parsed Excel data and user-specific history.
- **JSON Web Tokens (JWT)**: Manages user authentication and session security.
- **XLSX Library**: Parses Excel files into JSON format.

Key endpoints include `/api/login` for authentication, `/api/upload` for file processing, and `/api/data` for retrieving stored data.

5.2 Frontend

The frontend is built using:

- **React**: Provides a dynamic, component-based UI.
- **Tailwind CSS**: Implements the dark-themed, responsive design.
- **Chart.js**: Renders 2D bar charts.
- **Three.js**: Powers interactive 3D visualizations.
- **jsPDF and html2canvas**: Enables PDF downloads of 2D charts.

The UI is served at `http://localhost:3000`, with routing for login and upload pages.

6 User Flow

The user experience is designed to be intuitive:

1. Users visit the login page and enter credentials (`testuser`/`testpassword`).
2. Upon successful login, they are redirected to the upload page.
3. Users upload an Excel file, which is displayed as a table.
4. They select X and Y axes from dropdowns to generate 2D and 3D charts.
5. Users can download the 2D chart as a PDF or interact with the 3D chart (rotate, zoom, pan).
6. Each users uploaded data and chart settings are saved and accessible in future sessions.

7 Future Potential

While the MVP focuses on core functionality, future iterations could include:

- User registration and password management.
- Additional chart types (e.g., line, pie).
- Advanced analytics (e.g., statistical summaries).
- Multi-user collaboration features.

These enhancements would build on the MVP based on user feedback and requirements.

8 Conclusion

The Excel Analytics Platform MVP delivers a secure, functional, and visually appealing solution for uploading and analyzing Excel data. With features like secure login, file upload, data tables, interactive visualizations, and user-specific history storage, it meets the needs of users seeking to gain insights from their data. The dark-themed UI ensures a modern, professional experience, making the platform ready for testing and iteration.