



Pamantasan ng Lungsod ng Maynila



ANALYTICA AI

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science in Computer Science

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Introduction

Analytica AI is a web-based tool designed to revolutionize the way we analyze, interpret, and present data. By harnessing the capabilities of **Microsoft Excel** and **Microsoft Word**, Analytica AI bridges the gap between raw data and actionable insights. Its seamless integration of artificial intelligence empowers users to process complex datasets effortlessly, transforming them into clear, informative, and visually appealing outputs.

Overview of the Project

Key Features

- Simplified Data Analysis:** Analytica AI automates data handling, from cleaning and organizing datasets to performing advanced analyses.
- Dynamic Visualizations:** With a wide array of customizable chart types with different use-cases, users can represent their data in the most intuitive and impactful ways.
- Automated Insights:** The platform seamlessly integrated Artificial Intelligence to interpret trends, outliers, and correlations in the data, offering users meaningful insights.
- User-Friendly Interface:** Designed with simplicity and efficiency in mind, Analytica AI aims to be accessible to users of all skill levels. Its interface is intuitive, leveraging familiarity from Excel and Word.

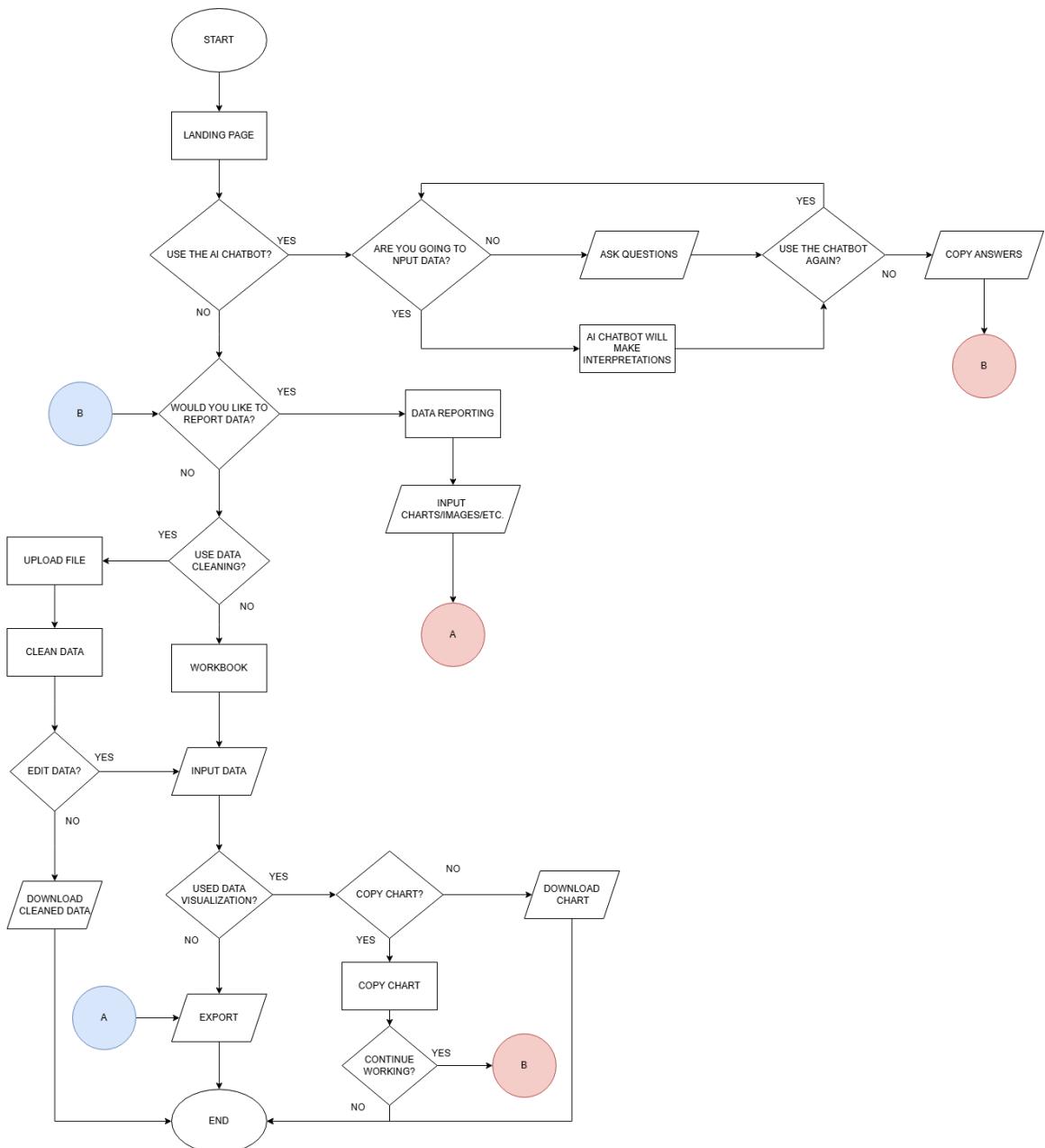
Data Visualization Methods Supported

To cater to diverse analytical needs, Analytica AI supports the following visualization methods:

- Line Chart:** Ideal for displaying trends over time or continuous data, enabling users to observe patterns and fluctuations.
- Scatter Plot:** Perfect for showcasing relationships between two variables and identifying correlations or clusters in data.
- Doughnut Chart:** A modern twist on the classic pie chart, used to illustrate proportions and contributions within a dataset.
- Column Chart:** A straightforward tool for comparing discrete categories or groups, making it easy to highlight differences.
- Stacked Bar Chart:** A powerful way to visualize part-to-whole relationships across categories, showing both individual contributions and total values.



System Flowchart





Figma design

Web Layout

The wireframe shows the Analytica AI homepage. At the top left is the logo and the word "ANALYTICA AI". Below it is a large title "Reimagine the Possible with Data". A subtext explains: "Analytica AI is an innovative online tool that transforms raw data into compelling and informative visual insights, combining the power of Microsoft Excel and Microsoft Word." A "Get Started" button is visible. The interface features a Microsoft Word-like ribbon at the top and a Microsoft Excel-like grid below. A large blue curved shape is on the right side.

The wireframe shows the Analytica AI dashboard. It includes tabs for "Work Book" and "Data Reporting". The main area is titled "WORK BOOK & DATA VISUALIZATION" and displays a Microsoft Excel spreadsheet with rows 1 through 18. Below the spreadsheet are buttons for "Copy Chart" and "Download Chart". Another section titled "DATA CLEANING TOOLS" has a "Choose file" input, a file name "Start-Data-Analysis-2.xlsx", and a "Clean Data" button. A message bubble says "Hi, I'm Cotlyst. Ask me anything!" with a hand icon. A small character icon is in the bottom right corner.



ANALYTICA AI

Work Book Data Reporting

WORK BOOK & DATA VISUALIZATION

File Home Insert Formulas Data View

A1 fx A B C D E F G H I J K L M N O

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Sheet1

Copy Chart Download Chart

Chat with Catalyst

Guides for Data Analytics
Keys in Creating Data Reporting
Example Prompts for Data Analysis

Type a message...

DATA CLEANING TOOLS

Choose file Start-Data-Analysis-2.xlsx Clean Data

ANALYTICA AI

Work Book Data Reporting

DATA REPORTING

New Open Export Undo Redo Image Table Link Bookmark Table of Contents Header Footer Page Setup Page Number

Text

Calibri 11

B I U S X_x

aA

Paragraph

Normal

Page 1 of 1



Mobile Layout



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The image displays two side-by-side screenshots of the ANALYTICA AI Data Reporting software interface.

Screenshot 1 (Left): Shows a blank white page with a toolbar at the top containing icons for New, Open, Export, Undo, Redo, Image, and Table. Below the toolbar is a vertical ruler on the left and a horizontal ruler at the bottom. At the bottom center is a small circular icon with a face. The status bar at the bottom indicates "Page 1 of 1".

Screenshot 2 (Right): Shows a similar interface but with a "Chat with Catalyst" section. This section includes a list of three items: "Guides for Data Analytics", "Keys in Creating Data Reporting", and "Example Prompts for Data Analysis". Below this is a text input field with the placeholder "Type a message..." and a send button. The status bar at the bottom indicates "Page 1 of 1".



Development Methods

The Analytica AI application uses several technologies to create a modern and adaptable web application. The tech stack includes:

- **React** for frontend development
- **Flask** for backend development
- **Namecheap** for domain name services.
- **Netlify** for frontend hosting
- **Ngrok** for backend hosting (limited)
- **Word & Excel API** via Syncfusion (with license) for integrating document and spreadsheet functionalities

The group has adapted the Agile Methodology process for development. The following includes the four sprints done by the group:

- **Sprint 1:** Design of user interfaces for landing pages and setting up the first APIs.
- **Sprint 2:** Backend setup with Flask, Ngrok connection and API structure for data handling.
- **Sprint 3:** Integrate Syncfusion APIs for document management (Word and Excel).
- **Sprint 4:** Deploy frontend on Netlify and integration testing.

It should be noted that the group did not strictly follow the previous setup and still went back to the requirements of previous sprints whenever necessary. The group had utilized Facebook's messenger in order to check up on the projects and for updates.



API Documentation

The Analytica AI application uses API to enhance productivity and streamline document and data processing workflows. As part of its core functionality, Analytica AI integrates with two powerful APIs provided by Syncfusion: the Syncfusion Spreadsheet and the Syncfusion Document Editor. Both APIs operate under a valid registered Syncfusion license, ensuring compliance and full access to premium features. These integrations allow Analytica AI to provide robust capabilities such as editing spreadsheets and creating or editing text documents, all within a seamless and user-friendly interface.

Licence Key

The screenshot shows the Syncfusion License Key generation interface. On the left, there's a sidebar with a user profile 'Golden Mist' and navigation links like 'My Dashboard', 'License & Downloads', 'Downloads & Keys', 'Claim License Key' (which is highlighted), 'Patches', 'Manage Trials', and 'Purchase & Renewals'. The main area is titled 'Claim License Key' with a dropdown for 'Version' set to '27.x.x'. It shows a generated license key: 'Ngo98R8/V1NDaf5cWWcCf1fpRmJGdId5fUVHvVZUTXxa500DNHVRdkdnWH5cdXrdRWIZVnNxWUQ+'. There are buttons for 'COPY TO CLIPBOARD' and 'SEND EMAIL'. A note at the bottom says: 'Note: A license key cannot be generated for our Java platform. If you are looking for a Java license key, please [click here](#). You can generate license keys only for major versions, so there's no need to change the key when updating to a service pack, weekly release, or patch versions.' Another note at the bottom right says: 'Please refer to this [help topic](#) to learn how to register your license key.'

Syncfusion Spreadsheet

The Syncfusion Spreadsheet API enables users to work with spreadsheet data directly within the application. Features such as file upload, editing, and saving are supported, mimicking the experience of using traditional spreadsheet software like Microsoft Excel or Google Sheets. The API also supports advanced functionalities particularly the visualization tool for data analysis.

1. Syncfusion API always start with Initialization for the registration of licence using **registerLicense**
2. Then it will use the **SpreadsheetComponent** or the core component that renders the spreadsheet interface. There are different components, but for the Analytica AI, we used:
 - a. **allowOpen** - Enables the "Open" functionality for spreadsheets.
 - b. **allowSave** - Enables the "Save" functionality for spreadsheets.



- c. **openUrl** - Specifies the URL for handling file open requests ("https://ej2services.syncfusion.com/production/web-services/api/spreadsheet/open")
 - d. **saveUrl** - Specifies the URL for handling file saving requests ("https://ej2services.syncfusion.com/production/web-services/api/spreadsheet/save")
 - e. **dialogueBeforeOpen** - Event triggered before a dialog opens.
3. For formatting the Spreadsheet, Syncfusion offers directives for organizing rows, columns, and cells.
 - a. **SheetsDirective** - Defines a collection of sheets.
 - b. **SheetDirective** - Represents a single sheet.
 - c. **RangesDirective** - Manages data ranges within a sheet.
 - d. **RangeDirective** - Defines individual data ranges.
 - e. **RowsDirective** - Defines a collection of rows.
 - f. **RowDirective** - Represents a single row.
 - g. **CellsDirective** - Manages cells within a row.
 - h. **CellDirective** - Represents a single cell.
 - i. **ColumnsDirective** - Defines a collection of columns.
 - j. **ColumnDirective** - Represents a single column.
 4. Lastly, the dependencies. In order to use the Syncfusion Spreadsheet for web application, we need to include the Syncfusion Spreadsheet Library using **@syncfusion/ej2-react-spreadsheet**
 - 5.

Syncfusion Document Editor

The Syncfusion Document Editor API provides rich-text editing capabilities, allowing users to create, edit, and format documents. Features include support for various document formats (e.g., DOCX, PDF). The editor is designed to offer the functionality of word-processing software in a web-based environment for data reporting.

1. Syncfusion API always start with Initialization for the registration of licence using **registerLicense**

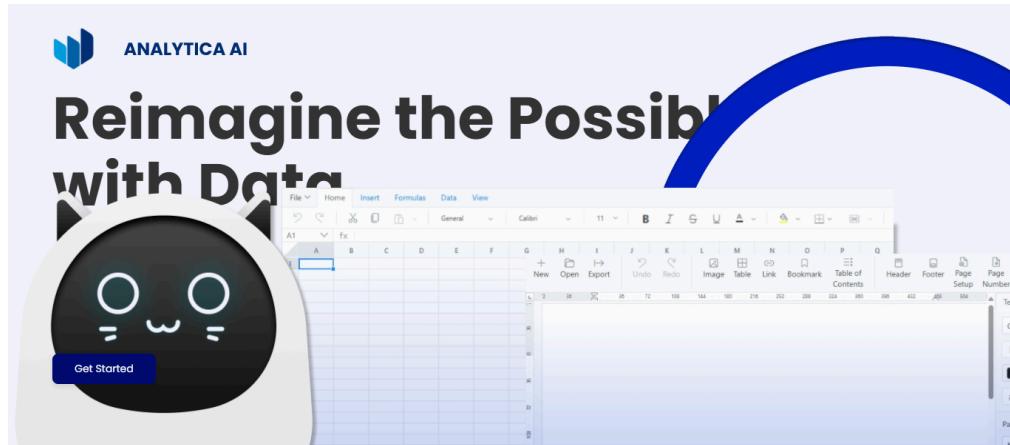


2. Then it will use the DocumentEditorContainerComponent or primary component for the Document Editor integration.. There are different components, but for the Analytica AI, we used:
 - a. **id** - Unique ID for the container.
 - b. **height** - Height of the container.
 - c. **width** - Width of the container.
 - d. **serviceUrl** - URL for Syncfusion's document service.
("https://services.syncfusion.com/react/production/api/documenteditor/")
 - e. **enableToolbar** - Enables the toolbar for the editor
 - f. **locale** - Sets the localization for the editor.
 - g. **toolbarItems** - Configures toolbar items
3. Unlike the Syncfusion Spreadsheet that uses directives, the Document Editor has Toolbar Customization.
 - a. **New** - Creates a new document.
 - b. **Open** - Opens an existing document.
 - c. **Export** - Exports the document in various formats (DOCX, PDF, etc.).
 - d. **Undo/Redo** - Supports undo and redo operations.
 - e. **Image/Table** - Allows inserting images and tables.
 - f. **Header/Footer** - Adds headers and footers.
 - g. **PageSetup** - Configures page settings like margins.
 - h. **Find** - Searches for text in the document.
4. And for the dependencies, we need to include the following:
 - a. **@syncfusion/ej2-react-documenteditor**
 - b. **@syncfusion/ej2-react-lists**
 - c. **@syncfusion/ej2-react-splitbuttons**
 - d. **@syncfusion/ej2-popups**

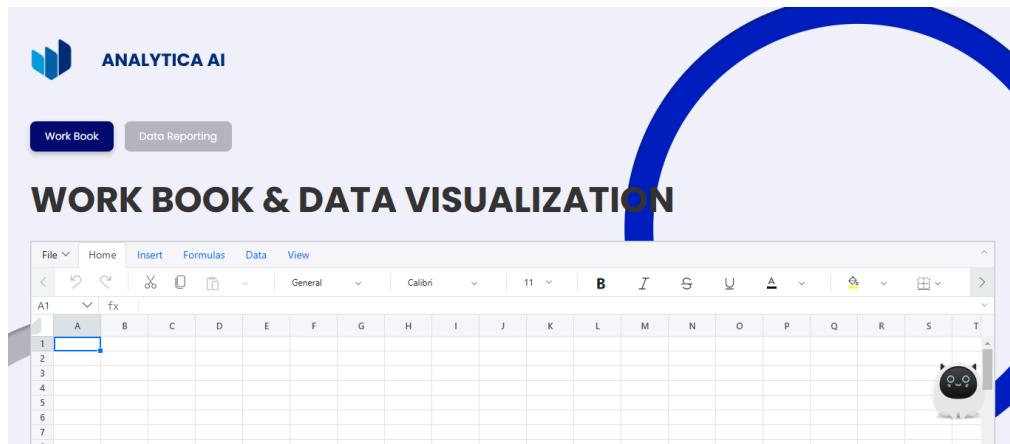


User's Manual

1. The user will be greeted by the landing page which consists of the application's branding. They can proceed to the application by clicking the 'Get Started' button near the bottom left corner.



2. After clicking the aforementioned button, they can access two (2) options from the application: WorkBook and Data Reporting. They will be able to access the AI chatbot, Catalyst, by clicking the cat-like figure on the lower right corner.



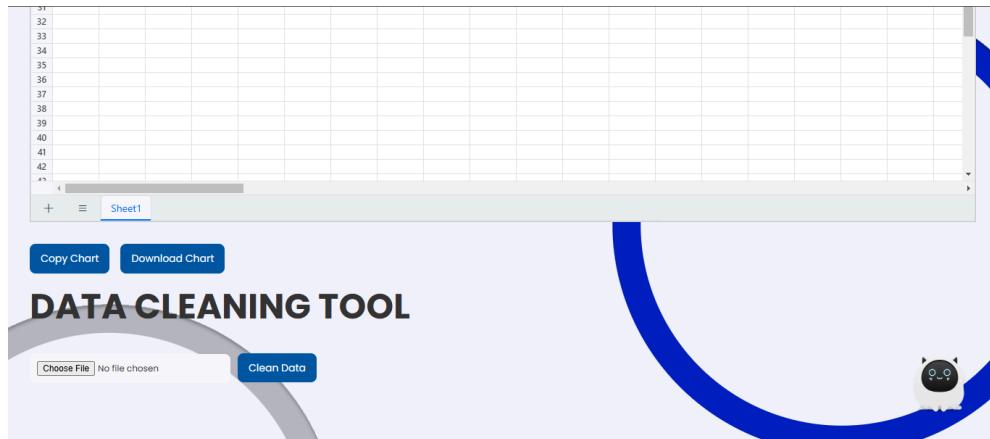


3. The user can explore the WorkBook section and its Excel function.

There are also additional options such as copying or downloading the chart they have created.



Scrolling more to the bottom, users can import the dataset they want to use and clean it automatically with the application's data cleaning tool function.



4. Next is the Data Reporting section of the application. The Data Reporting section of the website acts similar to Microsoft Word. Wherein the user can paste their copied charts, insert images, tables, etc.



5. The user can also access the AI chatbot Catalyst from the Data Reporting page. It functions similarly to that of your typical AI Chatbot, wherein the users can ask it



questions, input their copied cleaned data for the chatbot to create interpretations, etc.

The screenshot shows a Microsoft Word-like application window titled "DATA REPORTING". The ribbon menu includes "New", "Open", "Export", "Undo", "Redo", "Image", "Table", "Link", "Bookmark", "Table of Contents", "Header", and "Footer". The status bar at the bottom shows page numbers from 36 to 324. To the right of the main editor area is a vertical sidebar titled "Chat with Catalyst" containing three buttons: "Guides for Data Analytics", "Keys in creating Data Reporting", and "Example prompts for Data Analysis". Below these buttons is a text input field with the placeholder "Type a message..." and a blue send button. On the far right, there is a "Paragraph" style ribbon with options for "Normal", "Text", and "Font" settings.

The AI chatbot's answers can then be copied by the user to then paste onto the word-like format of the data reporting page. And from here, the user can export the word file into other file types such as pdf, word, etc.

The screenshot shows the same Microsoft Word-like application window with the "DATA REPORTING" title. The ribbon menu now has "Export" highlighted. A dropdown menu is open under "Export" showing four options: "Word Document (*.docx)", "Plain Text (*.txt)", "Word Template (*.dotx)", and "PDF (*.pdf)". The status bar at the bottom shows page numbers from 36 to 324. The right sidebar and Paragraph style ribbon are also visible.