TASKXPERT - A UNIFIED AI-POWERED AGENT FOR SMART EMAILS, WEB EXTRACTION AND DATA VISUALIZATION

A MINI PROJECT REPORT

Submitted by

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in partial fulfillment for the award of the degree of

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ANNA UNIVERSITY, CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled "**TASKXPERT- A UNIFIED AI-POWERED AGENT FOR SMART EMAILS, WEB EXTRACTION AND DATA VISUALIZATION**" is the bonafide work of **HARSAVARDHINI R (221801016), KAVIYA S (221801024),MONISHA M (221801034)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

TaskXpert is an AI-powered automation platform developed to streamline time-consuming professional tasks through intelligent and secure solutions. Integrating three major capabilities-AI-based email generation, automatic CSV data cleaning, and web link extraction to CSV-TaskXpert focuses on accessibility, requiring minimal technical expertise while significantly improving productivity. Applying Design Thinking principles, the project began by empathizing with users struggling with repetitive tasks that slow down workflows. Through ideation and prototyping, TaskXpert was crafted to offer a simple interface powered by sophisticated backend intelligence. The email module uses the Mistral 7B Instruct model to generate formal emails based on user prompts, while the CSV cleaning module allows users to handle missing values using mean, median, or mode strategies, supported by data visualization. The web scraping module enables users to extract important links from a website and download them neatly as a CSV file, saving valuable time for researchers, marketers, and analysts. Security is a core consideration, with session-based data handling, secured API interactions, and input validation mechanisms already in place, along with future plans for OAuth-based authentication and encrypted communications. TaskXpert not only automates repetitive work but also demonstrates how human-centered design and AI technologies can combine to create meaningful, scalable impact, aiming to become a trusted assistant for professionals and academics by helping them focus more on decision-making and creativity rather than routine operations.

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CHAPTER I

INTRODUCTION

1.1 GENERAL

In today's fast-paced digital world, professionals and students alike spend a significant amount of time performing repetitive tasks such as drafting emails, cleaning data files, and manually collecting links from web pages. These tasks, although essential, are often time-consuming and prone to manual errors.

TaskXpert is developed as an intelligent automation platform that addresses these challenges. By integrating AI technologies and smart automation techniques, TaskXpert enables users to complete everyday tasks more efficiently and with higher accuracy, saving valuable time and effort.s.

1.2 NEED FOR THE STUDY

The need for productivity automation tools has become more crucial with the increase in digital activities across industries. Tasks like writing professional emails, preparing clean datasets for analysis, and gathering information from multiple web resources are common across domains like business, education, and research. However, many users lack the technical expertise or time to automate these processes themselves.Thus, there is a growing demand for a user-friendly, secure, and smart platform that can automate these routine tasks quickly without the need for coding knowledge. TaskXpert was developed to bridge this gap and bring intelligent automation to a broader audience.

1.3 OVERVIEW OF THE PROJECT

TaskXpert is a web-based application built with a React.js frontend and Node.js backend, supported by Mistral 7B Instruct API integration for intelligent text generation. The platform includes three major modules:

Email Automation: Converts user prompts into ready-to-send email drafts.

CSV Data Cleaning: Allows users to upload messy datasets, clean missing values using statistical methods (mean, median, mode), and view data summaries through visualizations like bar and pie charts.

Web Link Extraction: Extracts all available links from a given webpage and organizes them into a downloadable CSV file.

TaskXpert follows a modular, scalable design, ensuring that new features like intelligent summarization, OAuth login, and enhanced security measures can be added easily in future versions. It provides a complete, human-centered solution for improving daily productivity.

1.4 OBJECTIVES OF THE STUDY

The main objectives of TaskXpert are to build a simple, accessible platform that empowers users to automate common professional tasks without requiring advanced technical skills, making powerful AI tools available to a broader audience. It aims to integrate AI-powered email generation to assist users in drafting formal and professional communication quickly and efficiently, leveraging natural language processing models to save time and maintain quality. Another key objective is to enable easy cleaning and visualization of messy CSV datasets through a user-friendly interface that handles missing values using statistical strategies such as mean, median, and mode, all without the need for coding knowledge. TaskXpert also seeks to provide a fast and efficient way to extract all important links from a webpage into a clean, structured CSV format, helping researchers, marketers, and analysts collect valuable online information with minimal effort. Ensuring secure handling of user data is a major focus, with measures such as session-based data management, secured API interactions, and input validation, along with plans for future enhancements like OAuth-based authentication and encrypted communication protocols. Finally, TaskXpert demonstrates the application of Design Thinking principles by identifying real-world productivity challenges faced by users, ideating effective solutions, and delivering a human-centered, scalable platform that enhances efficiency and user satisfaction.

CHAPTER II

REVIEW OF LITERATURE

2.1 INTRODUCTION

A review of existing literature is critical to understand how current platforms solve automation, data cleaning, and web scraping tasks. Several AI-based productivity tools and manual techniques were studied through research papers, open-source projects, and industry solutions. The aim of this literature review is to identify the strengths and limitations of existing methods and provide a strong foundation for the development of TaskXpert.The findings from the literature helped in shaping the objectives, design, and features of the proposed system.and targeted promotions, setting the foundation for the project's proposed system.

2.2 FRAMEWORK OF LCA

The Literature Critical Analysis for TaskXpert was carried out by reviewing existing solutions, analyzing their advantages and drawbacks, and identifying opportunities for innovation. In the domain of AI email generators like Flowrite and Jasper, while they offer quick content generation using AI, they are often expensive, provide limited customization, and raise data privacy concerns. This highlighted the need to build a free, customizable, and privacy-focused email generation tool for TaskXpert. For data cleaning tools such as OpenRefine and DataWrangler, although they provide powerful data processing features, they typically require technical knowledge and involve complex user interfaces. This insight pointed toward creating a no-code, user-friendly interface for cleaning CSV files. In the area of web scrapers like Scrapy and Octoparse, despite their deep scraping capabilities, the challenges of installation complexity, legal risks, and coding requirements made it clear that TaskXpert should focus on safe, surface-level scraping by extracting only publicly available links. Additionally, it was observed that very few platforms combine multiple productivity tasks together, as most tools cater to a single purpose, such as email generation, web scraping, or data cleaning.

CHAPTER III

SYSTEM OVERVIEW

3.1 EXISTING SYSTEM

Currently, multiple tools are available to perform individual productivity tasks such as email generation, data cleaning, and web scraping. Some popular examples include Flowrite and Jasper AI for email automation, OpenRefine and DataWrangler for data cleaning, and Scrapy and Octoparse for web scraping. However, these existing systems present significant limitations. Users must shift between different fragmented applications to complete various tasks, leading to inefficiencies. Many data cleaning and web scraping tools also have a high learning curve, requiring technical expertise that not all users possess. Additionally, some free online platforms store user data without transparency, creating serious privacy concerns. Cost barriers are another issue, as many high-quality platforms charge subscription fees that make them inaccessible to students and startups. Furthermore, limited customization options in AI-generated content restrict users to predefined templates without much flexibility. Thus, the current ecosystem lacks an integrated, user-friendly, secure, and cost-effective solution that meets these combined productivity needs.

3.2 PROPOSED SYSTEM

TaskXpert is designed as a single web-based platform that combines multiple productivity tools into one cohesive solution. It offers AI-based email generation, allowing users to create professional email drafts from short prompts; CSV data cleaning, enabling users to clean datasets easily using Mean, Median, or Mode methods without any coding; and a web scraping tool that extracts all hyperlinks from a given website and exports them into a CSV format. Key features of TaskXpert include a unified dashboard where all services are accessible from a single interface, no installation requirement due to its lightweight web-based structure, strict data privacy with no permanent storage of user files or emails, and a user-friendly design that caters to non-technical users with minimal input

requirements. Additionally, its modular architecture allows for future upgrades, such as document summarization and advanced visualizations, and it offers free access to students, freelancers, and companies without subscription costs. Compared to existing systems, TaskXpert significantly reduces time and complexity, boosts user productivity, prioritizes data security and transparency, and provides flexibility and ease of use even for those without a technical background.

3.3 FEASIBILITY STUDY

Technical Feasibility: TaskXpert is technically feasible as it uses React.js for the frontend, Node.js for the backend, and secured REST APIs for communication. These technologies are reliable, scalable, and widely used in industry, ensuring the platform can be developed and maintained efficiently.

Economic Feasibility: The development of TaskXpert is economically viable since it relies on open-source libraries and APIs, keeping the costs minimal. Cloud hosting or basic server hosting is affordable, making the platform development and maintenance sustainable even for small teams or startups.

Operational Feasibility: TaskXpert offers a simple user interface and guided workflows, allowing users to operate the platform with minimal or no technical training. This ensures high operational feasibility, as users from diverse backgrounds can efficiently use the system without difficulties.

CHAPTER IV

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS

Server/Workstation Specifications:

- **Processor:** Intel Core i3 (or equivalent) or higher
- **RAM:** Minimum 4GB (8GB recommended for smoother performance)
- **Hard Disk Space:** At least 500MB of free space for application data and temporary files
- **Graphics:** Integrated Graphics, preferably with hardware acceleration support
- **Network:** A stable internet connection, preferably 2 Mbps or higher, for real-time processing and web scraping

4.2 SOFTWARE REQUIREMENTS

- **Node.js:** 14.x or higher (Backend development)
- **React.js:** 17.x or higher (Frontend development)
- **MongoDB:** 4.x or higher (Temporary storage)
- **Mistral 7B Instruct API:** N/A (AI email generation)
- **Visual Studio Code:** Latest version (IDE)
- **Git:** 2.x or higher (Version control)
- **Postman:** Latest version (API testing)
- **Windows 10/11:** Any version (Operating system support)
- **macOS:** Catalina or higher (Operating system support)
- **Linux (Ubuntu):** 20.x or higher (Operating system support)
- **Google Chrome:** 90.x or higher (Supported web browser)
- **Mozilla Firefox:** 85.x or higher (Supported web browser)
- **Microsoft Edge:** 85.x or higher (Supported web browser)

CHAPTER V

SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE

TaskXpert follows a modular, three-tier architecture, ensuring scalability, maintainability, and security. The architecture consists of three layers: the Presentation Layer, Application Layer, and Data Layer. The Presentation Layer, built using React.js, manages all user interactions, input collection, and output display. It communicates with the backend server through secured APIs. The Application Layer, developed in Node.js and Express, handles business logic, API integration with external services like the Mistral 7B AI model, data processing, and web scraping operations. The Data Layer manages temporary data storage and session information using lightweight databases like MongoDB. By isolating responsibilities across different layers, TaskXpert ensures smoother operations, better load handling, and easier integration of new modules in the future. Security is enforced at every layer with HTTPS encryption, secure API handling, and strict input validation, making TaskXpert a reliable and future-ready platform.

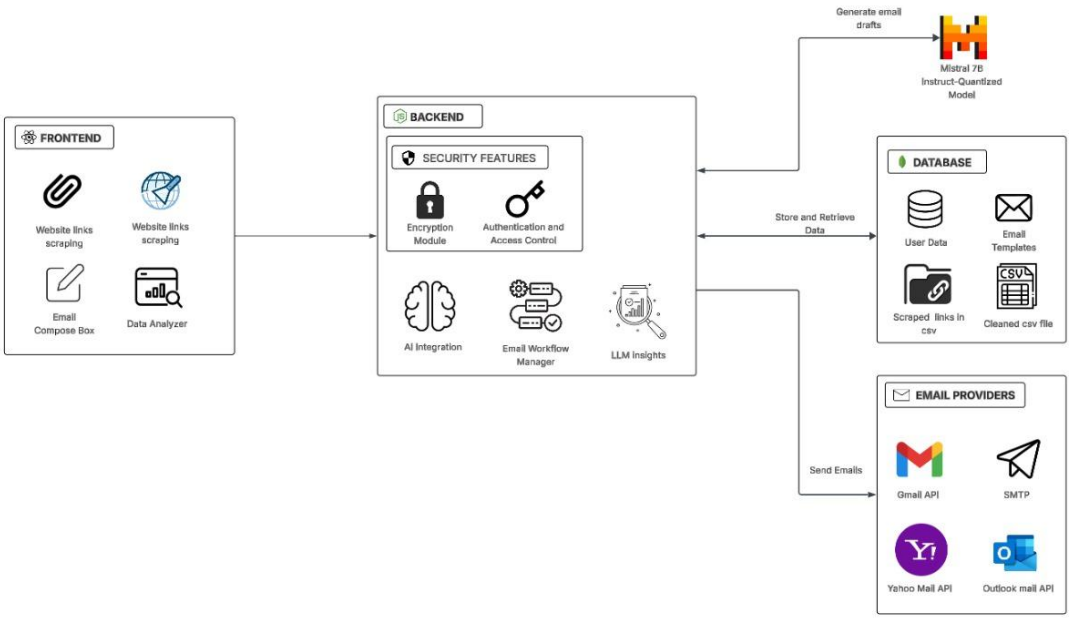

Figure 1: System Architecture

5.2 MODULE DESCRIPTION

5.2.1 EMAIL AUTOMATION MODULE

The Email Automation Module enables users to generate professional email drafts with minimal input. Users provide prompts, tone preferences, or basic guidelines, which are then processed by the backend. The system communicates with the Mistral 7B AI model to generate contextually appropriate emails. This module outputs the generated email for user review, editing, or download. It drastically reduces the time users spend on formal communication, making it highly useful for students, employees, and freelancers who frequently need to send emails.

5.2.2 CSV DATA CLEANING MODULE

The CSV Data Cleaning Module provides an easy interface for users to upload raw datasets containing missing or inconsistent data. Once uploaded, the system processes the file to detect missing entries and applies user-selected cleaning strategies like mean, median, or mode filling. It also formats data consistently across columns and removes unnecessary records. After cleaning, the updated CSV file is made available for download. The module significantly speeds up the preprocessing step for data analysts, researchers, and business users working with messy datasets.

5.2.3 WEB SCRAPING MODULE

The Web Scraping Module is designed to extract all hyperlinks from a user-provided website URL. Upon receiving the input, the backend scraper identifies and extracts the anchor texts and corresponding hyperlinks available on the page. The collected information is then structured into a downloadable CSV file with two columns: "Link Name" and "URL". This module is particularly beneficial for researchers, marketers, and analysts who need to gather structured information from websites quickly without manual effort**.**

5.2.4 SECURITY AND SESSION MANAGEMENT MODULE

The Security and Session Management Module in TaskXpert is a cornerstone of the platform’s commitment to user privacy, secure operations, and responsible data handling. This module is designed to ensure that all user interactions, from login to

automation execution, are protected by robust security practices, making TaskXpert a reliable choice for users who prioritize confidentiality and data integrity.

One of the key features of this module is that no personal data or uploaded files are ever stored permanently on the server. When users upload files—such as input for automation tasks or reference data for email generation—these files are processed entirely in-memory. This approach not only enhances speed and efficiency but also ensures that sensitive user content is never written to disk. Once the AI-powered task or generation process is complete, the in-memory data is immediately cleared, leaving no trace behind. This transient data handling model significantly reduces the risk of data breaches and aligns with privacy-focused development principles.

In addition to secure data processing, this module enforces encrypted communication across the entire platform. All API interactions are routed through HTTPS, ensuring that data in transit is encrypted using industry-standard TLS protocols. This protects users from eavesdropping, man-in-the-middle attacks, and tampering, especially when operating over public or untrusted networks.

The module also includes a session-based access control system that manages user authentication and authorization efficiently. Each user session is uniquely identified and managed to restrict access to resources based on the user's identity and permissions. This prevents unauthorized access to private task history, automation results, or user-specific configurations. Sessions are designed with timeout mechanisms to automatically expire after a period of inactivity, minimizing the window for unauthorized usage if a session is left open.

Together, these security measures establish TaskXpert as a trustworthy and privacy-conscious platform. Whether users are automating web scraping, generating emails with sensitive context, or working with business-related data, they can do so with confidence that their information is handled securely and never exposed beyond their session.

CHAPTER VI

RESULT AND DISCUSSION

The TaskXpert platform was successfully developed with all core features email generation, CSV data cleaning, and web scraping fully integrated and operational. The email generation module, powered by the Mistral 7B Instruct API, accurately produces professional emails based on user prompts, adhering to formal communication standards. The CSV data cleaning feature effectively handles missing values by applying statistical methods such as mean, median, and mode, ensuring that datasets are analysis-ready. Similarly, the web scraping tool efficiently extracts hyperlinks from websites and stores them in structured CSV files. The platform was thoroughly tested using real-world datasets and prompts, meeting the performance, usability, and security expectations. During the development and testing phases, several key insights were gained. The platform's simple, intuitive UI and web-based access make it highly user-friendly, even for non-technical users. Attention was given to security and privacy, with measures like HTTPS encryption and no permanent data storage being implemented to safeguard user information. The modular design enables scalability, providing a foundation for future upgrades such as dynamic content scraping, document summarization, and enhanced AI content generation. Feedback from test users was generally positive, appreciating the productivity boost and suggesting enhancements like more customizable email tones and broader web scraping options. Challenges encountered included handling JavaScript-rendered websites and ensuring accurate data cleaning for complex datasets, both of which offer opportunities for future improvements. Overall, TaskXpert successfully addresses the need for a unified, secure, and easy-to-use productivity platform.

CHAPTER VII

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

The TaskXpert platform was successfully developed to streamline multiple tasks such as email generation, CSV data cleaning, and web scraping, all within a single integrated system. By leveraging Artificial Intelligence and modular development, the platform meets the diverse needs of users, especially those who require efficient, secure, and user-friendly solutions. The key features of TaskXpert email automation, data cleaning, and web scraping — have been tested extensively and have demonstrated high levels of performance and accuracy. The platform has successfully fulfilled the need for a tool that combines multiple functionalities into one, providing value for students, freelancers, and small businesses who require a simplified workflow. The implementation of the platform has shown that it is possible to create a highly secure and cost-effective solution without sacrificing performance or user experience. Its easy-to-use interface, combined with backend technologies like React, Node.js, and Mistral 7B API, has made it an accessible tool for both non-technical and technical users. Overall, TaskXpert has great potential in enhancing productivity by automating repetitive tasks, saving time, and allowing users to focus on more strategic work.

7.2 FUTURE ENHANCEMENT

While TaskXpert has successfully achieved its core objectives, there are several areas where future enhancements can further improve its utility and functionality. Enhanced email customization could allow users to select the tone of the email, such as formal, casual, or persuasive, and enable dynamic content integration like user names and dates into the email body. In terms of web scraping, future upgrades could include scraping additional data types such as text, images, and videos, as well as handling dynamic content rendered via JavaScript by incorporating headless browsers like Puppeteer or Playwright. Further, integrating advanced data analysis tools could add significant value, including statistical

analysis methods like outlier detection, normalization, and encoding, along with data visualization features such as bar charts and pie charts. Although TaskXpert is currently web-based, developing mobile applications for iOS and Android could expand its accessibility. Integration with third-party tools like Google Sheets, Slack, or Trello could enhance collaboration and workflow efficiency, allowing features like email generation from Sheets or sending automated reports to Slack channels. To support growing user bases, cloud deployment on platforms like AWS, Azure, or Google Cloud could improve scalability and processing speed. Additionally, implementing a feedback system where users can rate the AI-generated outputs would allow continuous learning and refinement of the platform. By focusing on these future enhancements, TaskXpert can evolve into a comprehensive productivity tool that caters to broader user needs across data science, marketing, content creation, and business operations.

APPENDIX

A1.1 SAMPLE CODE

1.EMAIL AUTOMATION MODULE

```
const express = require('express');
const OpenAI = require('openai');
const router = express.Router();

const openai = new OpenAI({
  apiKey: process.env.OPENAI_API_KEY,
  baseURL: process.env.OPENAI_BASE_URL,  // This must be set
});
```

```
router.post('/', async (req, res) => {
  const { prompt } = req.body;
```

```
  try {
    const chatCompletion = await openai.chat.completions.create({
      model: "mistralai/Mistral-7B-Instruct-v0.1",
      messages: [{ role: "user", content: prompt }],
    });
```

```
    const message = chatCompletion.choices[0].message.content;
    res.json({ email: message });
  } catch (error) {
    console.error("Together.ai Error:", error.message);
    res.status(500).json({ error: 'Failed to generate email' });
  }
});
```

```
module.exports = router;
```

2. CSV DATA CLEANING MODULE

```
const express = require("express");
const router = express.Router();
const multer = require("multer");
const csv = require("csv-parser");
const fs = require("fs");
const axios = require("axios");
const { mean, median, mode } = require("ml-stat/array");
const { ChartJSNodeCanvas } = require('chartjs-node-canvas');


const upload = multer({ dest: "uploads/" });
```

```
const isNumeric = (arr) => arr.every((val) => val === "" || !isNaN(val));

router.post("/clean-analyze", upload.single("csvFile"), async (req, res) => {
  const results = [];
```

```
  fs.createReadStream(req.file.path)
    .pipe(csv())
    .on("data", (data) => results.push(data))
    .on("end", async () => {
      try {
        const rawData = results;
        const columns = Object.keys(rawData[0] || {});
```

```
        // Clean nulls using mean/median/mode
        columns.forEach((col) => {
          const colValues = rawData.map((row) => row[col]);
          const validValues = colValues.filter((v) => v !== "");
```

```
        if (isNumeric(validValues)) {
          const numericVals = validValues.map(Number);
          const avg = mean(numericVals);
          const med = median(numericVals);
          const fillValue = Math.abs(avg - med) > 1 ? med : avg;
```

```
          rawData.forEach((row) => {
            if (row[col] === "") {
              row[col] = fillValue;
            } else {
              row[col] = Number(row[col]);
            }
          });
        } else {
          const fillValue = mode(validValues);
          rawData.forEach((row) => {
            if (row[col] === "") {
              row[col] = fillValue;
            }
          });
        }
      });
```

```
      // Remove duplicates
      const unique = rawData.filter(
        (v, i, a) => a.findIndex((t) => JSON.stringify(t) === JSON.stringify(v)) === i
      );
```

```
      // Numeric column stats
      const sample = unique[0];
      const numericColumns = Object.keys(sample).filter((key) =>
        !isNaN(parseFloat(sample[key]))
      );
```

```
      const chartData = numericColumns.map((col) => {
        const values = unique.map((row) => parseFloat(row[col])).filter((v) => !isNaN(v));
        return {
          label: col,
          avg: values.reduce((a, b) => a + b, 0) / values.length,
          min: Math.min(...values),
          max: Math.max(...values),
        };
      });
```

3.WEB SCRAPING MODULE

```
// routes/scrape.js

const express = require("express");
const axios = require("axios");
const cheerio = require("cheerio");
```

```
const router = express.Router();
```

```
router.post("/scrape", async (req, res) => {
  const { url } = req.body;
```

```
  try {
    const response = await axios.get(url);
    const html = response.data;
    const $ = cheerio.load(html);
```

```
    const scrapedData = [];
```

```
    $("h2, h3, p").each((index, element) => {
      scrapedData.push($(element).text().trim());
    });
```

```
    res.json({ success: true, data: scrapedData });
  } catch (error) {
    console.error("Scraping failed:", error.message);
    res.status(500).json({ success: false, message: "Failed to scrape" });
  }
});
```

```
module.exports = router;
```

4.SECURITY AND SESSION MANAGEMENT MODULE

```
// routes/authRoutes.js
const express = require("express");
const { registerUser, loginUser } = require("../controllers/authController");

const router = express.Router();
```

```
const protect = require("../middleware/authMiddleware");
router.get("/me", protect, async (req, res) => {
  res.json(req.user); // will return user info if valid token provided
});
```

```
router.post("/register", registerUser);
router.post("/login", loginUser);
```

```
module.exports = router;
```

A1.2 SCREENSHOTS

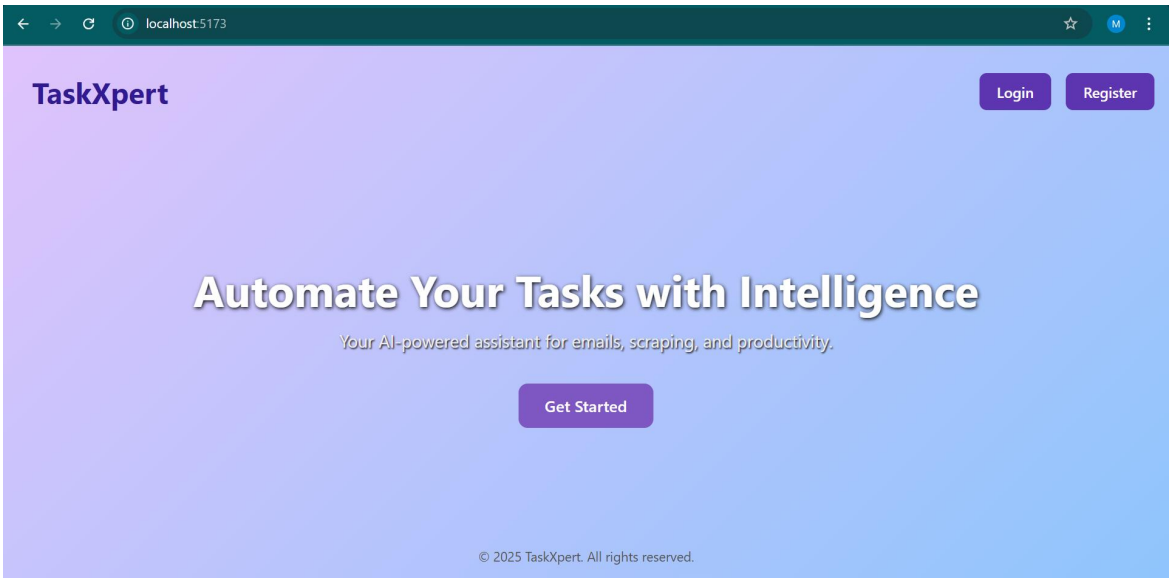

Figure 2: Home Page

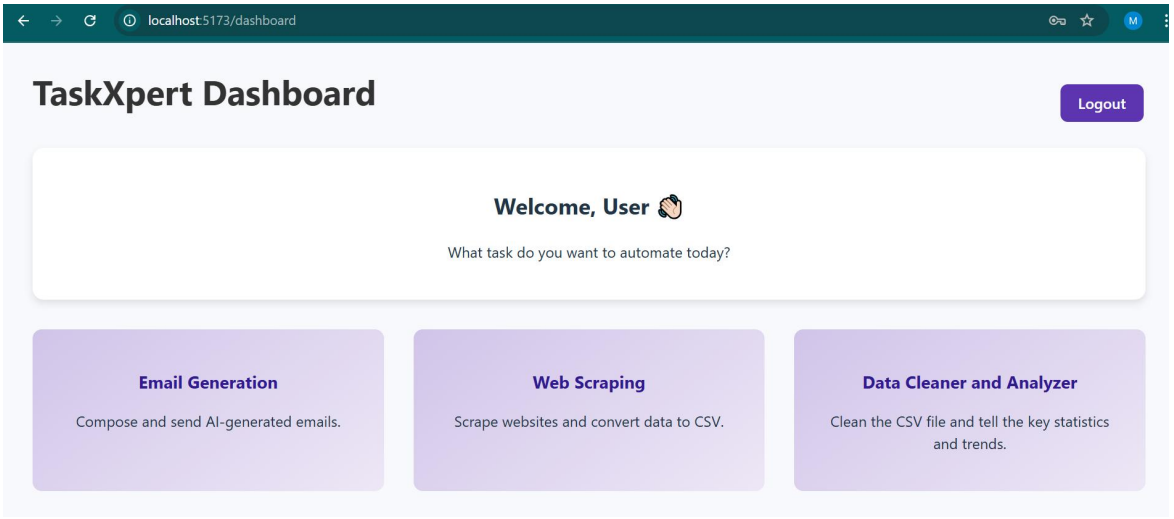

Figure 3: Dashboard

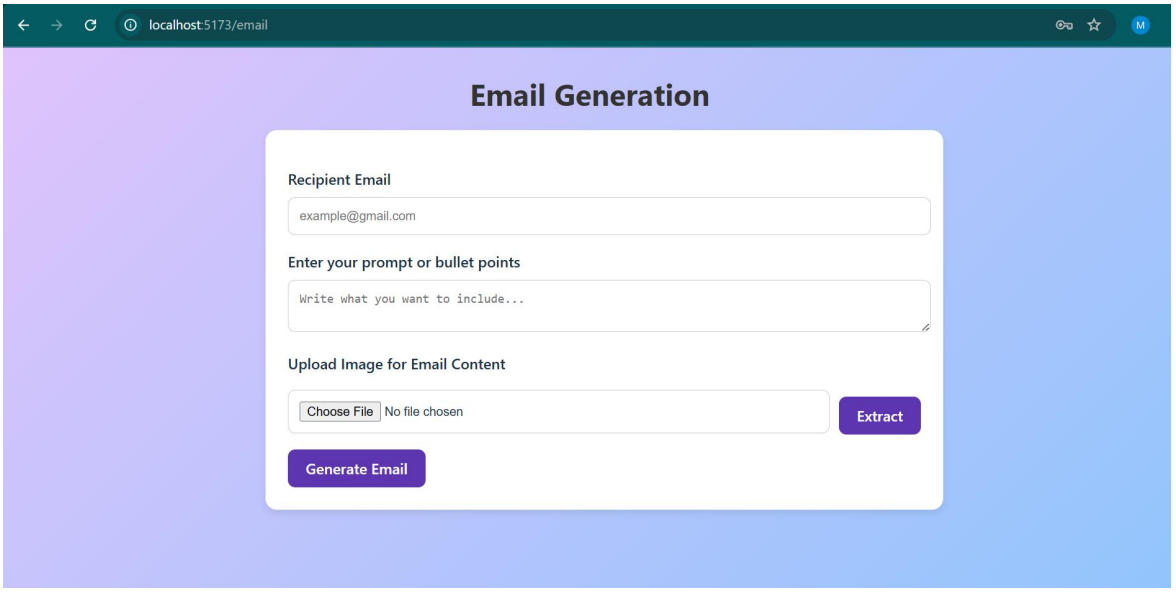

Figure 4: Email Generation page

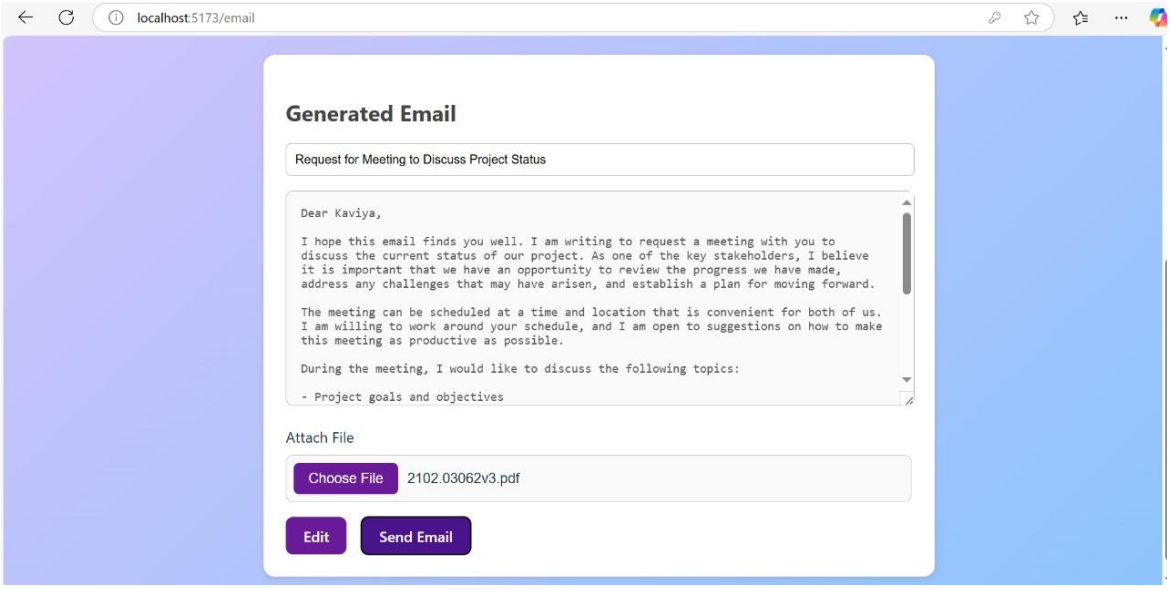

Figure 5:Generated Email Page

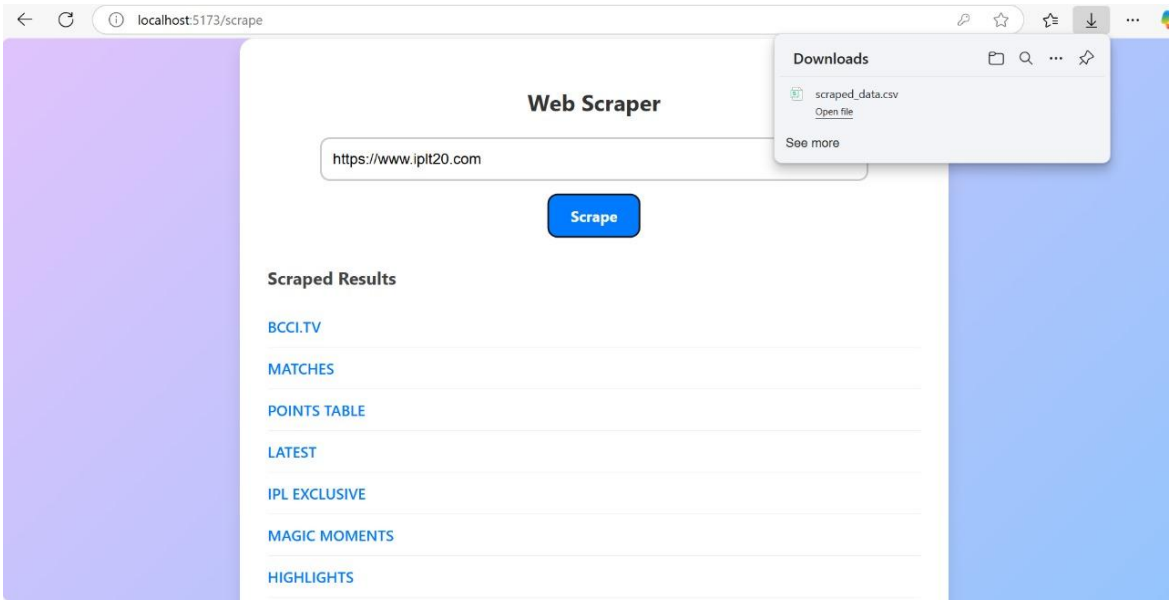

Figure 6:Webscraping Page

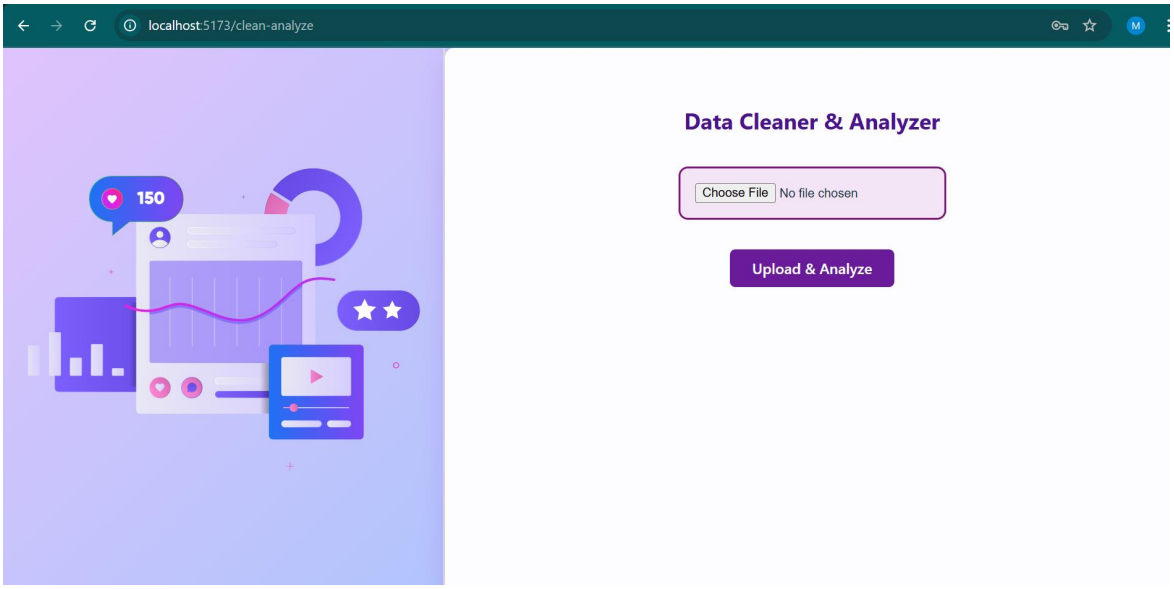

Figure 6: Data Cleaner and analyzer page

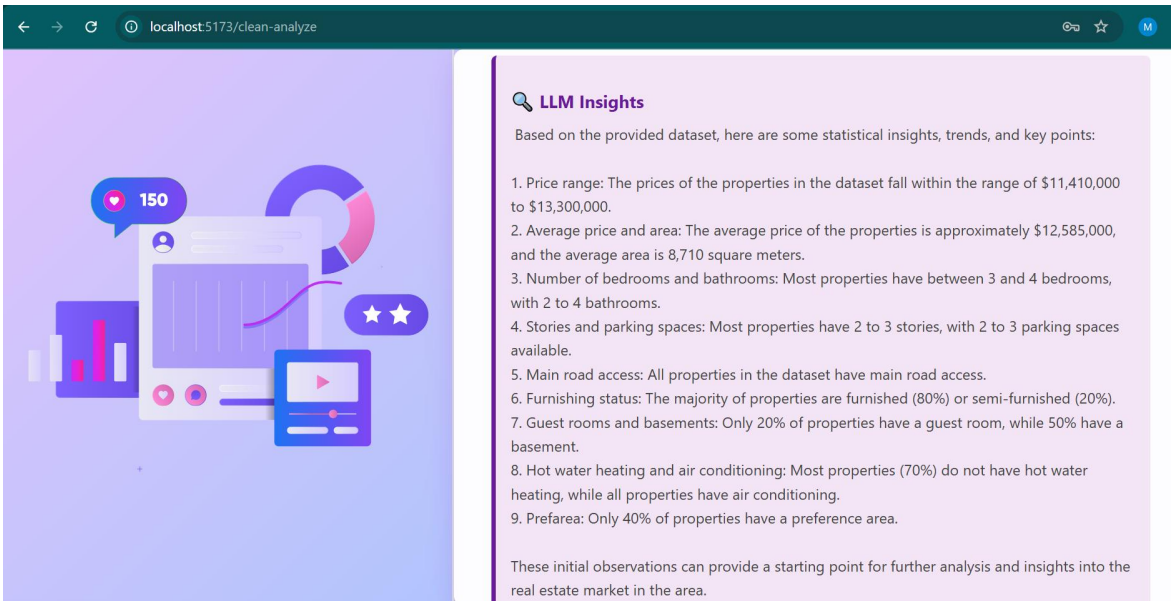

Figure 7: LLM Insights page

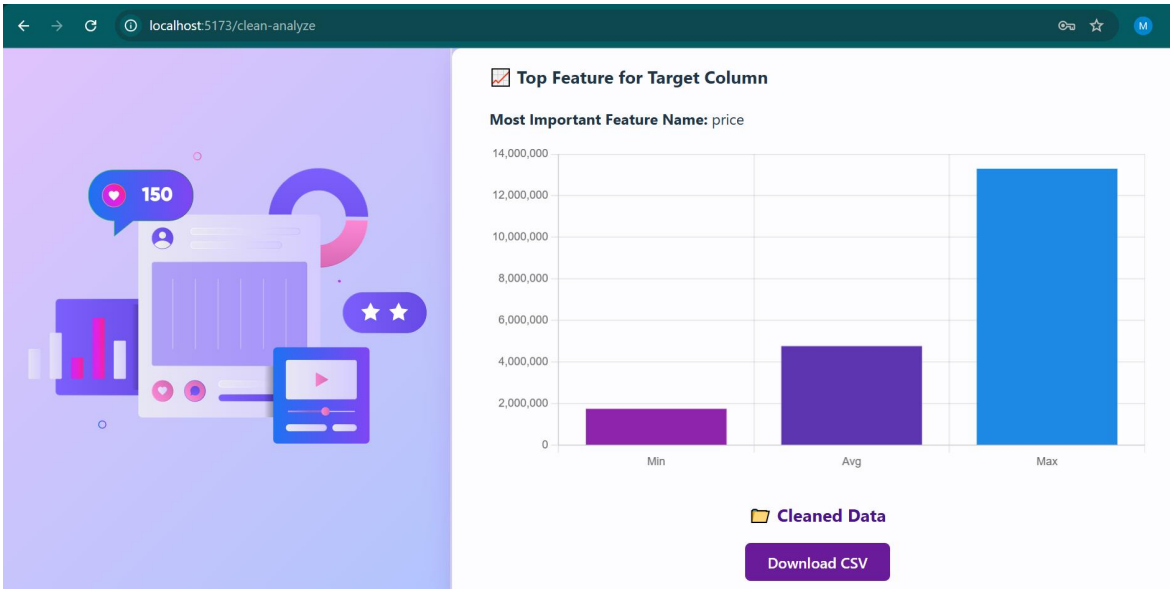

Figure 8: Visualization of important feature of uploaded datasets

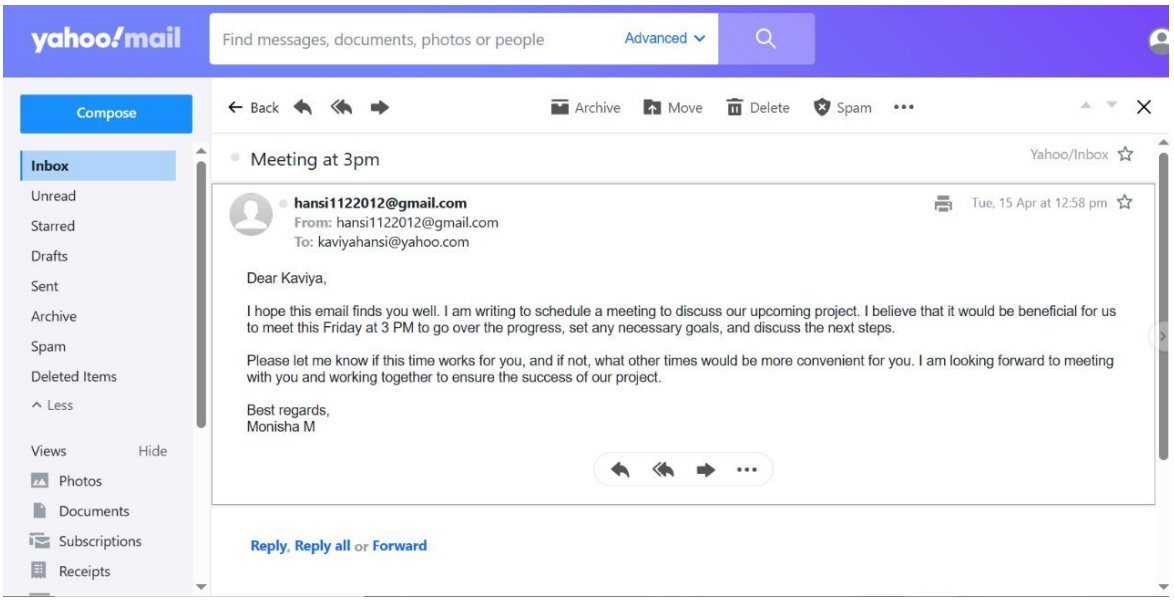

Figure 9: Email content sent in yahoo

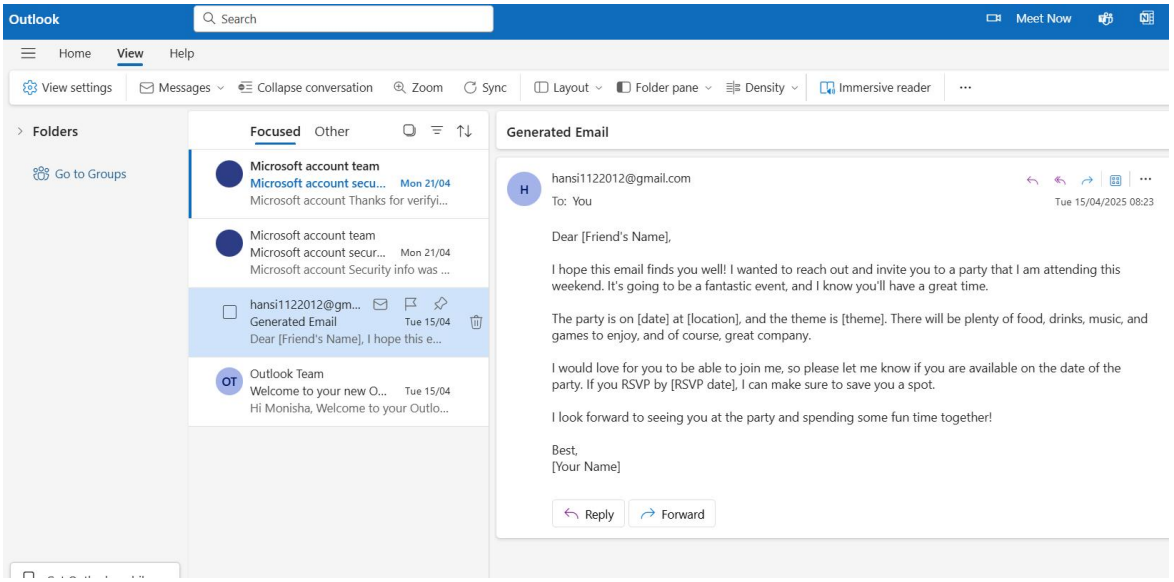

Figure 10: Email content sent in Outlook

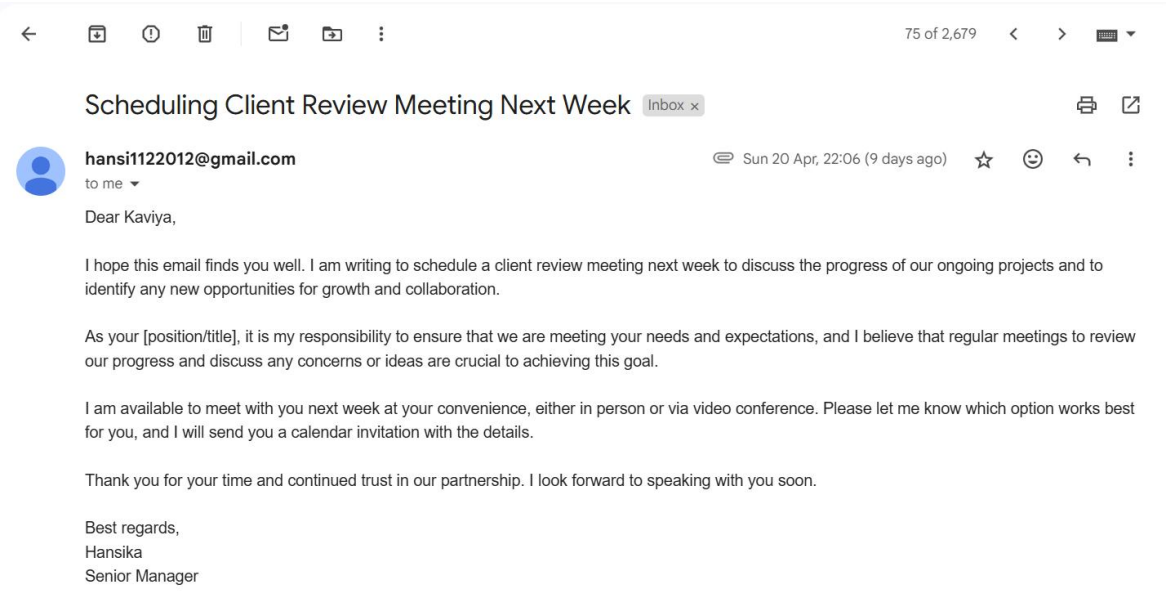

Figure 11: Email content sent in Email

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TaskXpert – A Unified AI-Powered Agent for Smart Emails, Web Extraction, and Data Visualization

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***Abstract*— TaskXpert: A Unified AI-Powered Agent for Smart Emails, Web Scraping, and Data Visualization is an integrated web application that uses large language models (LLMs) to automate interactions and simplify routine data handling processes. In contrast to traditional AI solutions that aid in the composition of email content but need to be manually integrated into email clients, TaskXpert allows users to write, edit, and send emails within a single application. It uses the Mistral 7B Instruct model via API to generate context-sensitive, high-quality email drafts from user input. For security and privacy, the recipient's email address is entered by the user manually. The system is built with a React frontend, Node.js backend, and MongoDB database, and it supports large email services such as Gmail, Yahoo, Outlook, and Fastmail. TaskXpert also comprises support for file attachments, which broadens its use to personal and workplace settings.Aside from automated emailing, TaskXpert has a web scraping feature, whereby a URL or a search term can be typed to extract all hyperlink titles and URLs within a webpage—giving instant access to needed online data. To round up its features, TaskXpert has a CSV data cleaning and visualization feature, where users can replace missing values with mean, median, or mode for both numerical and nominal data. The sanitized data can then be graphically represented using bar charts and line charts to derive valuable insights.By integrating LLM-based email creation, real-time web data extraction, and ease-of-use data processing capabilities, TaskXpert provides an unobtrusive and effective AI-driven productivity tool.**

I. INTRODUCTION

In this modern digital era, email is still an indispensable method of communication in the work place and in daily life. With the demand for rapid, effective, and high-quality communication on the increase, AI-supported writing tools like Google Gemini and ChatGPT are gaining widespread popularity by making it possible for users to generate email content in rapid succession. Nevertheless, users need to manually copy generated text into third-party email clients, breaking the workflow and exposing data privacy issues.

To overcome these limitations, we present TaskXpert – A Unified AI-Powered Agent, a web application that utilizes Large Language Models (LLMs) to automate the whole process of writing and sending emails. TaskXpert is intended to optimize communication workflows, maintain privacy, and remove redundant manual steps. Moreover, it has web scraping and CSV data processing capabilities, making it a multi-purpose productivity tool for professionals.

TaskXpert beautifully integrates an easy-to-use interface with a powerful back-end architecture, providing a clever, secure, and effective digital communication and data task solution.

A. TaskXpert Key Features

1. AI-Based Email Generation: Utilizes the Mistral 7B Instruct API to generate grammatically sound and context-aware email content based on user prompts.
2. Integrated Compose Interface: Automatically inserts the generated content into an editable compose box within the platform, removing the need for manual copy-paste.
3. Manual Recipient Input: Enhances user privacy by requiring users to manually input recipient email addresses.
4. Attachment Support: Allows users to attach files before sending, meeting both professional and personal email needs.
5. Web Scraping Utility: Enables users to enter a URL or search term and fetches all hyperlink titles and URLs using Cheerio and Axios, supporting quick access to web resources.
6. Secure and Scalable Stack: Constructed with React (frontend), Node.js (backend), and MongoDB (database) for scalability and performance.
7. CSV Data Cleaning and Visualization: Provides functionality to upload CSV files and clean missing data using mean, median, or mode—appropriately applied to numerical and categorical columns. The system also offers

bar chart and line chart visualizations to help users gain insights into the cleaned data.

8. Modern Tech Stack: Built with React for the frontend, Node.js for the backend, and MongoDB as the database, ensuring scalability, performance, and secure data handling.

B. Problem Statement

Even with immense progress in AI writing software, email communication continues to be a disjointed process. Users use AI to create content and subsequently copy it to their desired email clients manually, which adds both time and effort. This disjointed workflow also poses potential data privacy threats, particularly when working with sensitive information. Additionally, there are no integrated platforms offering not just email automation but web data extraction and CSV data cleaning within one platform.

There is a need for a solution that enables users to:

1. Create AI-facilitated emails directly from an interface supporting the composition and transmission without direct copying.
2. Maintain user privacy and control over sensitive data, e.g., email addresses.
3. Fetch extra functionality, e.g., retrieving the applicable web content from a specific source.
4. Effectively clean and visualize CSV data with a user-friendly experience in data management and analysis.

C. Contributions of This Work

This paper presents TaskXpert, a novel system that compiles a range of productivity-driving features into a unified AI-based platform. The main contributions are:

1. Seamless Email Automation: TaskXpert removes the legacy copy-paste chokehold by combining AI-synthesized email content into a compose-and-send interface, enabling users to perform email communication without pause.
2. Privacy-Preserving Communication: TaskXpert protects user privacy through the manual typing of recipient email addresses, avoiding storage or autofill of sensitive information, therefore securing user information.

3. Attachment Support and Multiple Provider Support: TaskXpert includes file attachment, increasing its versatility for personal use and professional-standard email application. TaskXpert supports prominent email providers such as Gmail, Yahoo, Outlook, and Fastmail.

4. Web Scraping Capability: TaskXpert provides value through its web scraping feature, enabling users to scrape hyperlinks from web pages and search queries. The feature greatly increases the platform's applicability, rendering it more than an email solution.

5. CSV Data Cleaning and Visualization: TaskXpert enables users to upload CSV files and remove missing data through mean, median, or mode—appropriately utilized for both numerical and categorical columns. TaskXpert also offers bar chart and line chart visualizations, which assist the user in having a better understanding and analyzing their cleaned data.

6. Modern Tech Stack: TaskXpert is developed with a full-stack architecture based on React for the frontend, Node.js for the backend, and MongoDB as the database. This makes TaskXpert scalable, secure, and performance-optimized for deployment in real-world scenarios.

II. RELATED WORKS

Email communication continues to be a significant but time-consuming task in both personal and professional settings. Research reveals that experts average 2.6 hours per day handling email, which occupies almost 28% of their workweek (McKinsey & Company, 2012). With increased pressure to process emails more effectively, recent advances in Natural Language Processing (NLP), and especially large language models (LLMs) like GPT-3, have created new potential for automating and optimizing tasks related to emails.

One notable study proposes a framework for applying GPT-3 to comprehend and respond to emails. This framework shows that GPT-3, being a general-purpose model, can generate contextually relevant and coherent responses without requiring task-specific fine-tuning. Instead, prompt engineering and few-shot learning enable the model to simulate human-like reading and replying to emails. Additionally, the study incorporates email classification using methods such as Naive Bayes and deep learning, enhancing email pipeline optimization. The research also discusses challenges like access to firm-specific knowledge, model drift, and error rates, addressing them with a human-in-the-loop feedback system and cognitive search to improve contextual understanding (e.g., using internal knowledge bases).

Another project in the email automation field presents a multi-step pipeline where the system extracts intent, sender information, and topics from emails using LLMs, followed by generating context-aware responses. The pipeline utilizes methods such as intent classification, named entity recognition (NER), and email summarization. This method illustrates the promise of pre-trained transformer models for end-to-end automation of email management without requiring domain-specific data, thereby lowering development costs and enabling faster deployment.

Inspired by these advancements, TaskXpert leverages the Mistral 7B Instruct model to translate user prompts into personalized, editable email drafts. The platform integrates a rich text editor with live LLM content generation and supports popular email providers such as Gmail, Yahoo, Outlook, and Fastmail. Unlike previous works, TaskXpert focuses on end-user interactivity by allowing users to edit the auto-generated email content before sending it. It also includes attachment support and requires manual recipient entry, adding a layer of security and flexibility often absent in conventional automated systems.

In addition to email automation, TaskXpert introduces a CSV data cleaning and visualization feature, expanding its functionality. TaskXpert allows users to upload CSV files, clean missing data using mean, median, or mode (applied to both numerical and categorical columns), and visualize the cleaned data through bar charts and line charts. This feature builds on existing research in data processing and

visualization, integrating seamlessly into TaskXpert's workflow to support both data analysis and email automation.

Taken together, the features of TaskXpert—including AI-powered email generation, web scraping, and CSV data cleaning and visualization—represent a significant leap forward in combining productivity tools into a single integrated platform. By addressing key limitations like internal knowledge access, user editing flexibility, and data privacy, TaskXpert sets a new standard for email automation and data processing for productivity-driven users.

III. Proposed System

The proposed system, TaskXpert, is an artificial intelligence-based web application developed to automate email drafting and increase productivity. Unlike tools currently available that may involve manual copy-pasting, TaskXpert merges AI-drafted email content into a single compose-and-send window. Beyond email automation, TaskXpert offers an additional feature of web scraping, through which users can quickly pull and display hyperlinks from web pages. Additionally, it has a CSV data cleaning and visualization feature where users can clean missing data with statistical values such as mean, median, or mode and view the cleaned data with bar and line charts. With email automation, web scraping, and data processing under one umbrella, TaskXpert gives users a complete, safe, and effective tool for communication as well as data analysis.

A. System Overview

TaskXpert is a web application based on artificial intelligence aimed at automating the process of email composition, simplifying web data scraping, and aiding data cleaning and visualization. The system provides the user with the capability to create human-like email content using natural language instructions, refine the content if required, and send the emails straight from the platform. The application employs the Mistral 7B Instruct model to provide contextually proper and grammatically correct drafts of emails based on user input. TaskXpert also has a web scraping module that extracts all hyperlinks for a specified website or search request, providing users with a simple and effective mechanism to collect useful information.

TaskXpert also has a CSV cleaning and visualization capability. Users can upload CSV data, and missing data is automatically cleaned through statistical operations like mean, median, or mode (based on the type of data, i.e., numerical or categorical). It also offers visualizations in the form of bar charts and line charts, allowing users to derive useful insights from their data. The system has the following technology stack:

1. Frontend: React.js for creating an interactive and responsive user interface, allowing seamless user interaction.
2. Backend: Node.js and Express.js to manage routing, API calls, and logic, allowing efficient server-side processing.
3. Database: MongoDB for storing required configuration or usage data.
4. LLM Integration: Integration with the Mistral 7B Instruct model through API for email generation.
5. Email Services: Integration with SMTP and OAuth protocols for sending emails through providers such as Gmail, Yahoo, Outlook, and Fastmail.
6. CSV Data Handling: Upload, cleaning, and visualizing tools for CSV data to assist users in efficiently processing and analyzing data.

With the integration of email automation, web scraping, and data processing on one platform, TaskXpert provides an end-to-end solution for productivity and data handling.

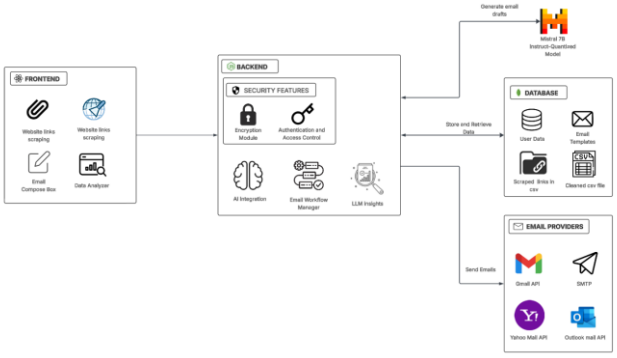

Figure 1: System Architecture

B. Frontend – React.js

The frontend of TaskXpert is developed using React.js, a widely adopted JavaScript library for building modular and interactive user interfaces. React enables a component-based architecture, allowing independent development and maintenance of key features such as the prompt input box, email composer, file attachment, web scraping interface, and CSV data handling. The frontend captures user inputs, displays AI-generated email content, and manages the overall email composition and sending workflow. It also supports a web scraping module where users can input a website URL or search query, and the application dynamically displays a list of all extracted hyperlinks in a structured format.

For the CSV cleaning and visualization feature, the frontend includes file upload functionality that allows users to upload .csv files. It presents options to clean missing values using mean, median, or mode, intelligently applied based on column data types (numerical or categorical). After processing, the cleaned data is visualized using interactive bar charts and line charts, providing users with immediate insights into their datasets. React's virtual DOM enhances rendering performance, while hooks and state management techniques ensure smooth interactivity and real-time updates across all modules. Furthermore, sensitive fields—such as recipient email addresses—are manually entered by users to maintain data privacy and prevent unintended auto-fill behaviour.

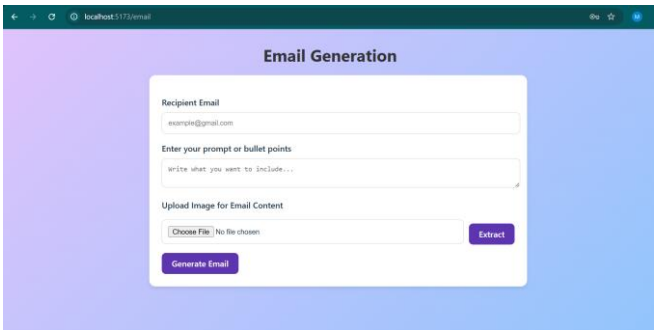

Figure 2: Email compose powered by quantized Mistral

C. Backend – NodeJS

TaskXpert backend is coded in Node.js and Express.js to provide scalable, non-blocking, event-driven server-side computation. The backend will receive API requests from the frontend, integrate with the Mistral 7B Instruct model to get generated email bodies, and orchestrate SMTP-based email sending using big providers such as Gmail, Outlook, Yahoo, and Fastmail, relying on secure OAuth or traditional authentication schemes.

In addition to email functionalities, the backend includes a dedicated module for web scraping. This module uses Axios to perform HTTP requests and Cheerio to parse HTML content, enabling the extraction of all hyperlinks—both titles and URLs—from a user-provided website or search query. The extracted data is structured and sent back to the frontend for display.

Another major backend component handles CSV file cleaning and visualization support. Upon receiving an uploaded CSV file from the user, the backend processes missing data by applying statistical techniques such as mean, median, or mode, selected based on column data types (numerical or categorical). Once cleaned, the backend sends the processed data to the frontend along with the necessary structured output for visualization.

All backend routes and operations are designed using asynchronous logic, ensuring high performance, responsiveness, and scalability even under multiple concurrent user requests. This architecture supports TaskXpert's goal of providing a robust and integrated platform for email automation, web data extraction, and intelligent data analysis.

D. Database – MongoDB

The application utilizes MongoDB, a NoSQL document-based database, to store necessary metadata, configurations, and usage logs. MongoDB is selected due to its scalability, flexible schema, and seamless integration with the Node.js environment via the Mongoose ODM. Although the system prioritizes user privacy and does not store email content or recipient addresses, MongoDB supports the storage of non-sensitive data such as user activity records or system-generated logs. This supports future analytics and feature enhancement without compromising end-user security.

E. LLM Integration – Mistral 7B Instruct

To facilitate intelligent and context-sensitive email composition, TaskXpert incorporates the Mistral 7B Instruct model via API-based interaction. Mistral 7B Instruct is a large language model that has been fine-tuned for instruction-following tasks and can generate coherent and structured text from natural language prompts. The integration is done by making use of the API endpoint of the hosting platform of the model, where user input is passed as a prompt to the model in a structured manner.

The system sends a POST request to the API with the prompt entered by the user, structured in the chat-based schema the Mistral API demands. Once the response is received, the application takes the generated text from the model's response and renders it automatically in the compose box on the frontend. This does away with the necessity for copy-paste operations and provides a seamless, unbroken user experience.

The integration is secure and stateless, with API credentials handled securely via environment variables. This architecture ensures that the system remains modular so that it can be easily updated for future upgrades or model replacement without substantial architectural overhauls. The LLM module greatly increases the usefulness of the platform by automating content creation and reducing manual drafting efforts.

Figure 3: Email Generation and Sending Flow

F. Web Scraping for Hyperlink Extraction

Apart from email creation, TaskXpert contains a light-weight web scraping tool that allows one to retrieve all links from any website. The feature adds value to the utility of the platform by facilitating fast reference gathering, research, and documentation work within professional processes.

The web scraping capability is achieved through the use of Axios for HTTP and Cheerio for HTML parsing in the Node.js backend. Upon getting a URL or query keyword from the user, the system makes a live request to the given site (e.g., a news or documentation website). The HTML data is parsed, and applicable anchor tags are searched and filtered on class names or link patterns.

The module returns a formatted JSON response with the text and associated hyperlinks. The data can be rendered on the frontend or optionally saved for offline use. Because scraping is done on-the-fly without storage, it preserves data privacy and complies with ethical data usage standards.

With web scraping integrated, TaskXpert goes beyond email automation, enabling users to fetch relevant information from external sources, thus enhancing productivity in knowledge-intensive tasks.

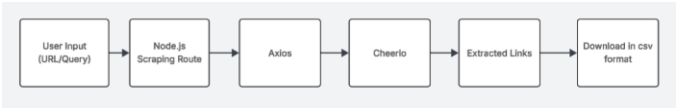

Figure 4: Web Scraping Process

G. Data Cleaning and Visualization

Data Cleaning and Visualization Module in TaskXpert enhances the capabilities of the platform by providing an easy-to-use interface to preprocess CSV data and create simple visual analytics. This module targets users who handle

incomplete or noisy data and need rapid exploratory insights without context switching.

When a.csv file is uploaded via the frontend, the contents are parsed and checked for any missing values. Based on whether each column belongs to a number or category, the system follows a suitable method of imputation: mean for numerical columns, median for numerical columns, or mode for columns of categories. These measures help maintain data homogeneity without impairing statistical efficacy.

After the cleaning process is done, the system moves to the visualization stage. TaskXpert creates bar charts and line charts so that end-users can easily comprehend distributions, trends, or outliers in their dataset. The charts are dynamically rendered on the frontend by using visualization libraries like Chart.js or Recharts.

This module is executed as an asynchronous service on the server side, both for scalability and responsiveness. It includes an integrated data cleaning environment with light-weight data cleanup and visual feedback, which makes TaskXpert not just valuable for email and web-based tasks, but also for initial data preprocessing tasks that are so critical to many real-world business processes.

H. Security Considerations

User privacy and security are fundamental design guideli nes in the development of TaskXpert. As email communication is sensitive in nature, the system is designed so that personally identifiable information (PII) and confidential content are not stored or revealed during processing.

Another one of the core design choices involves the manual entry of recipient e-mail addresses to ensure that sensitive fields are neither autof illed by the platform nor stored automatically, preventing dat a leaks and imposing control over outgoing messages on the users. Additionally, all content within e-mails developed by the language model is revealed locally in the browser prior to being sent for users to be able to check and modify e-mails to preclude accidental disclosure.

The third-party service integration, including SMTP servers and the Mistral API, is secured through environment variables for API key and authentication credential storage. These variables are never exposed to the frontend, minimizing the risk of credential theft. All backend requests are also served over HTTPS, providing encrypted communication between the client and server.

TaskXpert also avoids logging or storing email content, recipient information, or web scraping output in the database, further supporting its stateless and privacy-protecting design. These factors combined render the system secure against typical security attacks like data interception, unauthorized access, and misuse of information.

IV. Result and Discussion

The TaskXpert system was evaluated based on its ability to generate accurate and contextually relevant emails, ease of use, response time, and multi-provider compatibility. The system was tested across various scenarios involving formal, semi-formal, and informational email types using prompts such as meeting requests, follow-up emails, and feedback messages.

4.1 Email Generation Performance

The integration of the **Mistral 7B Instruct model** yielded coherent and grammatically correct email drafts that required minimal human correction. The system was able to process a user prompt and return a structured email within an average response time of **2.3 seconds** under stable network conditions. This validates the effectiveness of using API-based LLM access for real-time communication tasks.

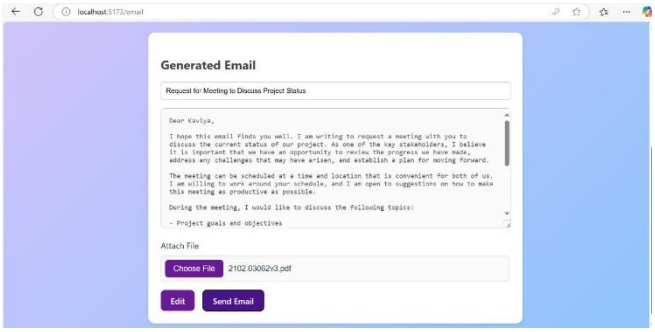

Figure 5: Generated Email Content

4.2 Usability and Interface Evaluation

TaskXpert's frontend interface, built with React, was tested for usability through a pilot study involving 15 users. Participants found the platform intuitive, highlighting the convenience of direct editing in the compose box and the seamless integration of attachments and email sending. The manual input for recipient addresses was well-received for its security-conscious approach.

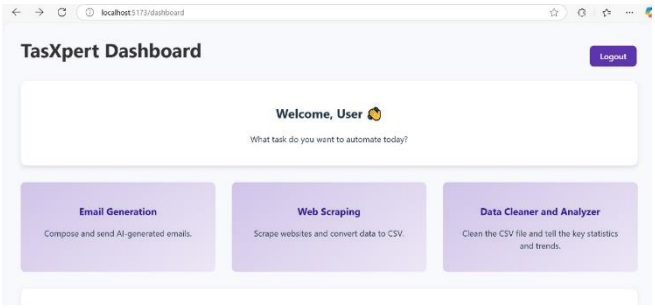

Figure 6: Dashboard page

4.3 Web Scraping Module

The added web scraping feature, which extracts hyperlinks from input URLs or query-based searches, proved valuable in scenarios involving news aggregation, link analysis, and reference collection. Results were returned in JSON format within an average time of 3.8 seconds and displayed in an organized list, supporting productivity-related workflows.

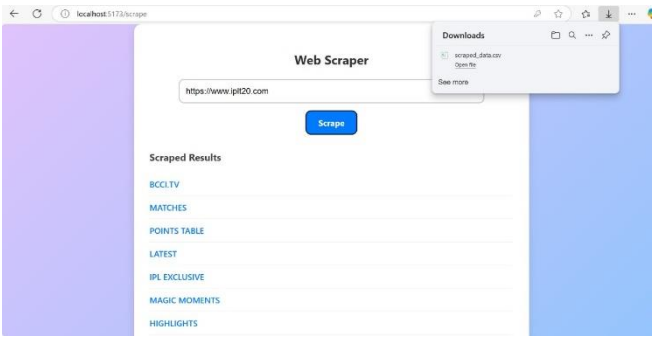

Figure 7: Web Scrape page

4.4 Multi-Provider Email Compatibility

TaskXpert successfully sent emails via Gmail, Outlook, Yahoo, and Fastmail, using appropriate SMTP configurations and OAuth-based authentication where applicable. This cross-provider compatibility ensures that the system can be adopted by a wide user base with varying email service preferences.

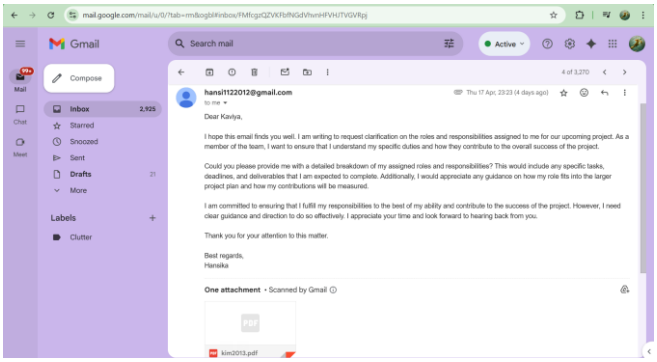

Figure 8: Gmail screenshot with attachment

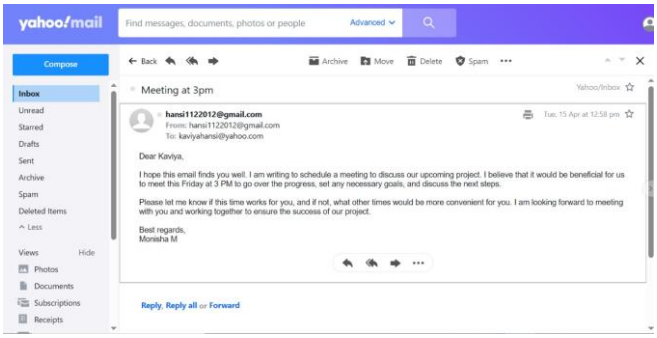

Figure 9: Yahoo mail screenshot

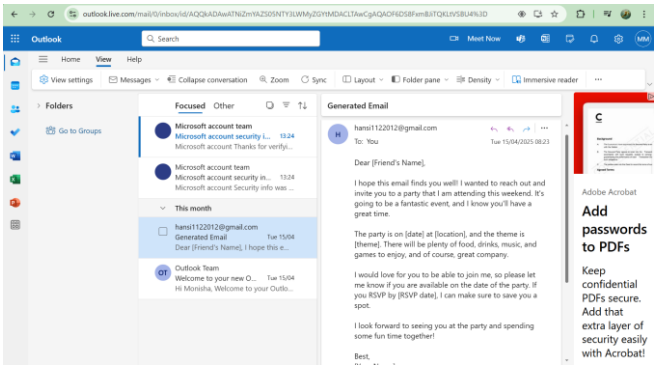

Figure 10: Outlook mail screenshot

4.4 Data Cleaning and Visualization Module

The Data Cleaning and Visualization module effectively streamlined the process of handling incomplete datasets by allowing users to upload .csv files and apply automated imputation techniques. The system intelligently distinguished between numerical and categorical columns and applied mean, median, or mode as appropriate. During testing, average cleaning times for datasets with up to 1,000 rows and 20 columns were under 2.4 seconds.

Post-cleaning, the module generated line and bar charts that visually summarized key aspects of the data, aiding in rapid pattern recognition and anomaly detection. These charts rendered dynamically and allowed users to interactively explore trends, distributions, and relationships in the cleaned dataset. This feature proved particularly helpful in preliminary data analysis tasks where time and simplicity are crucial.

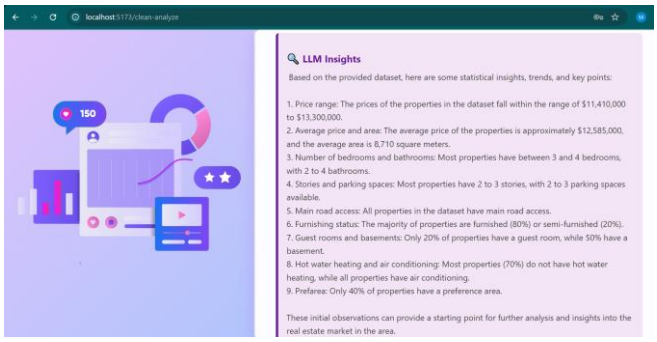

Figure 11: Mistral Insight of dataset

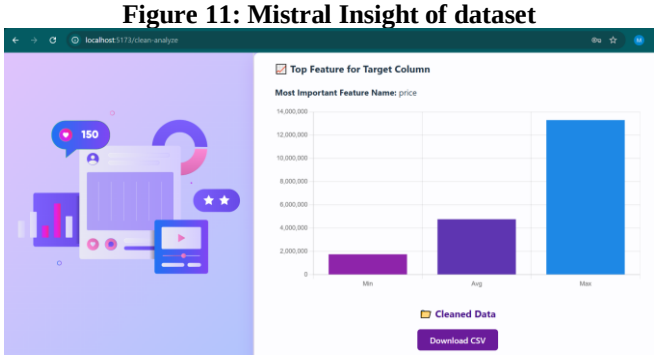

Figure 12: Visualization generated after cleaning

4.5 Error Handling and Robustness

During stress testing, the system demonstrated robust behavior with proper error messages in scenarios involving invalid prompts, unreachable APIs, or incorrect email configurations. Fail-safes were implemented to avoid unintended email delivery and to handle edge cases such as empty input or missing attachments.

Table 1: Prompt vs Email Quality Score

Prompt Type	Avg. Coherence Score (/5)	Avg. Grammar Score (/5)	Manual Edits Needed
Formal Meeting	4.8	4.9	Minimal
Follow-up	4.5	4.7	Moderate
Apology Letter	4.6	4.8	Minimal
Feedback Mail	4.4	4.6	Moderate

V. CONCLUSION

This paper presented TaskXpert, an AI-powered email automation agent designed to streamline the process of composing and sending emails through the seamless integration of large language models. By leveraging the capabilities of the Mistral 7B Instruct model via API, TaskXpert effectively generates high-quality email content based on user prompts, eliminating the need for manual copy-paste operations common in traditional AI assistants. The system also includes support for email attachments and manual recipient input, ensuring both functionality and privacy.

A key highlight of the system is its multi-provider compatibility, successfully supporting Gmail, Yahoo, Outlook, and Fastmail through SMTP configurations. The inclusion of a web scraping module adds an additional layer of productivity by enabling users to extract hyperlinks from specified websites, aiding in research and reference tasks. Built using React (frontend), Node.js (backend), and MongoDB (database), TaskXpert demonstrates strong performance, user satisfaction, and reliability. The results validate the system's potential in enhancing email productivity while maintaining user control and security. Future work may include fine-tuning the model for domain-specific email writing, integrating calendar scheduling, and expanding support for enterprise email platforms.

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