

Invoice generator

A PROJECT REPORT

Submitted by

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BACHELOR OF ENGINEERING

in

Computer Engineering



College of Technology

Aditya Silver Oak Institute of Technology



**SILVER OAK
UNIVERSITY**
EDUCATION TO INNOVATION

Silver Oak University, Ahmedabad

November, 2024



Aditya Silver Oak Institute of Technology
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CERTIFICATE

This is to certify that the project entitled “**Invoice Generator**” has been carried out by “**Rahul Zanjrukiya(2102030400392)**”, under my guidance in fulfillment of the Minor Project Subject of Bachelor of Engineering in Computer Engineering – 7th Semester of Silver Oak University, Ahmedabad during the academic year 2024- 2025.

ज्ञानं परमं भूषणम्

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Head of the Department

Acknowledgement

Firstly, we would like to thank the project stakeholders for their invaluable guidance, support, and resources, which helped shape the project objectives and provided a clear direction for the development process. Your insights and feedback were instrumental in refining the project requirements and aligning them with the overall goals. We extend our appreciation to the development team for their hard work, dedication, and expertise in bringing this project to life. Their commitment to high-quality work, attention to detail, and innovative problem-solving made it possible to tackle challenges effectively and maintain the project timeline. We also acknowledge the support of the quality assurance team for their meticulous testing and constructive feedback, which ensured the delivery of a robust and reliable application. Your efforts in identifying and addressing potential issues contributed significantly to the success of this project.

Yours Sincerely

Rahul Zanjrukiya (2102030400392)

Abstract

This document outlines a 90-day project timeline for the development of a software application, breaking down each phase involved in the development lifecycle. The primary phases include Requirement Gathering, Analysis, Design, Coding, Testing, Implementation & Deployment, and Documentation. Each phase has a defined duration and schedule, with certain phases overlapping to optimize time and resource efficiency. The project begins with Requirement Gathering, where essential requirements are collected and documented. This is followed by the Analysis phase, where the gathered requirements are examined to define detailed specifications. The Design phase then focuses on creating the architecture and detailed system design to guide the development process. Coding is the most extended phase, spanning over multiple stages, where the development team writes, tests, and integrates code to build the application. Testing follows to ensure quality and adherence to the requirements, with issues resolved before deployment. Implementation & Deployment occurs towards the end of the timeline, preparing the system for release. Documentation runs in parallel throughout the project, ensuring that each phase is adequately recorded for future reference and maintenance. This structured timeline enables efficient resource allocation and task management, facilitating the successful delivery of the project within the specified timeframe. The use of overlapping phases minimizes delays and maximizes productivity, aiming to meet all project goals effectively by the end of the 90-day schedule.

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CHAPTER 1 : INTRODUCTION

- Invoicing is a critical aspect of any business, playing a pivotal role in ensuring accurate billing and smooth financial operations. The demand for a seamless, efficient, and automated invoicing system has grown as businesses seek to reduce manual errors and save time. This project introduces a React-based Invoice Generation System built with Material-UI (MUI) for UI design and Redux for state management.
- The system empowers users to create, manage, and edit invoices with ease, offering features like real-time previews, PDF generation, and download capabilities. By leveraging modern front-end technologies, the project ensures a responsive and user-friendly interface, while Redux allows for efficient state management, enabling smooth handling of complex data flows.
- Material-UI provides a consistent and customizable design framework, ensuring the system is visually appealing and highly responsive across different devices. React's component-based architecture promotes reusable and maintainable code, making it easy to expand the system with additional features in the future. This project aims to streamline the invoicing process, reduce errors, and enhance business efficiency through a modern, intuitive web application.

1.1 Project summary

- This project focuses on the development of a React-based Invoice Generation System that simplifies the process of creating, managing, and exporting invoices. Utilizing Material-UI (MUI) for a responsive and customizable interface and Redux for centralized state management, the system offers a robust solution for businesses needing efficient invoicing.
 - Invoice Creation: Users can input client details, add products or services, and automatically calculate totals, taxes, and discounts.
 - Editing & Management: Invoices can be edited, previewed in real-time, and managed with ease, providing flexibility in billing.
 - PDF Generation & Download: The system enables users to generate clean, professional PDF versions of invoices, which can be downloaded or shared.

1.2 Purpose

- The purpose of this project is to develop an efficient and user-friendly invoice generation system that streamlines the billing process for businesses. By leveraging modern web technologies such as React, Material-UI (MUI), and Redux, the system aims to automate the creation, editing, previewing, and management of invoices. It seeks to reduce manual errors, improve the accuracy of financial transactions, and enhance the overall invoicing workflow.

1.3 Scope

- The scope of this project encompasses the development and deployment of a web-based Invoice Generation System using React, Material-UI (MUI), and Redux. This system is designed to assist businesses in automating their invoicing processes by providing features that streamline invoice creation, management, and distribution.
- The project includes functionalities such as invoice creation, where users can input essential details like client information, product descriptions, pricing, and tax calculations, with the system automatically calculating totals and applying relevant taxes or discounts. Additionally, it will feature real-time previews of invoices, allowing users to verify all details before saving or finalizing. Users will also have the capability to edit and update invoices at any time, ensuring flexibility in modifying invoice content based on client needs.

1.4 Technical and Literature Review

- The development of the Invoice Generation System leverages modern web technologies and frameworks, specifically React, Material-UI (MUI), and Redux. React is a popular JavaScript library for building user interfaces, allowing for the creation of reusable components that can efficiently manage the state of an application. Its component-based architecture enhances maintainability and scalability, making it ideal for complex applications like invoicing systems.
- Material-UI (MUI) serves as the design framework for this project, providing a comprehensive set of pre-designed components that facilitate responsive and visually appealing user interfaces. MUI adheres to Google's Material Design principles, which promote consistency and usability across different devices. By utilizing MUI, the Invoice Generation System can ensure that users experience an intuitive interface, regardless of the device they are using.
- Redux plays a crucial role in managing the application state, particularly in complex applications where multiple components may need to access and modify shared data. It provides a predictable state container that helps in maintaining a centralized store for invoices, facilitating easier data flow and state management across the application. The integration of Redux in this project will enhance the overall user experience by ensuring that changes in invoice data are reflected seamlessly across the UI.

CHAPTER 2 : SYSTEM REQUIREMENT STUDY

- The System Requirement Study outlines the necessary hardware, software, and functional requirements for the development and deployment of the Invoice Generation System. This study ensures that the system will meet user needs and operate effectively within the intended environment.

2.1 Functional Requirements

- 2.1.1 **User Authentication:** The system should allow users to create accounts, log in, and manage their profiles. User roles may include admin and standard users with different levels of access and permissions.
- 2.1.2 **Invoice Management:** Users should be able to create, view, edit, and delete invoices. Each invoice must include fields for client details, product or service descriptions, quantities, pricing, taxes, discounts, and total amounts.
- 2.1.3 **Real-Time Preview:** The system should provide a real-time preview feature that allows users to view invoices as they are being created or edited, ensuring accuracy before finalization. **PDF Generation:** Users must have the ability to generate invoices in PDF format, enabling easy downloading and sharing.
- 2.1.4 **Search and Filter Options:** The system should allow users to search for and filter invoices based on various criteria such as date, client name, or invoice status.
- 2.1.5 **Customization Options:** Users should be able to customize invoice templates, including the addition of logos, modification of layouts, and adjustments of terms and conditions.
- 2.1.6 **Data Storage and Retrieval:** The system must store invoice data securely and allow for easy retrieval of past invoices.

2.2 Non-Functional Requirements

- 2.2.1 **Performance:** The system should load quickly and efficiently handle user requests, ensuring minimal latency during invoice creation and retrieval.
- 2.2.2 **Security:** User data, including sensitive information, must be protected through secure authentication processes and data encryption. The system should adhere to best practices in cybersecurity.

- 2.2.3 Usability: The user interface should be intuitive and user-friendly, allowing users to navigate the system with ease. Documentation and help features should be provided to assist users.
- 2.2.4 Scalability: The system must be designed to accommodate future enhancements and an increasing number of users and invoices without compromising performance.
- 2.2.5 Compatibility: The system should be compatible with modern web browsers to ensure accessibility for a broad user base.

2.3 Software Requirements

- A development environment with Node.js and npm for managing dependencies and running the application.
- A code editor or Integrated Development Environment (IDE) for development, such as Visual Studio Code.
- Libraries and frameworks including React, Material-UI (MUI), and Redux.
- A database for storing invoice data, such as MongoDB or PostgreSQL.

CHAPTER 3 : SYSTEM DESIGN

This system design diagram represents an Invoice Generation System with interactions between the User, Server, and Database.

1. User Registration:

- The user enters registration details, which the server stores in the database.
- After successful storage, the server confirms registration to the user.

2. Invoice Generation:

- The user requests to generate an invoice, prompting the server to retrieve the necessary user data from the database.
- Once the data is retrieved, the server displays the generated invoice to the user.

3. Invoice Preview:

- The user can request a preview of the invoice.
- The server responds by displaying the invoice preview to the user.

4. Invoice Download:

- The user can download the invoice as a PDF.
- The server generates the PDF and sends it to the user.

5. Invoice Editing:

- If the user wants to edit an invoice, they can request it.
- The server retrieves the invoice data from the database, allowing the user to view and edit it.

3.1 System Design Diagram

User Registration:

- The user enters registration details, which the server stores in the database.
- After successful storage, the server confirms registration to the user.

Invoice Generation:

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3.1 System Design Diagram

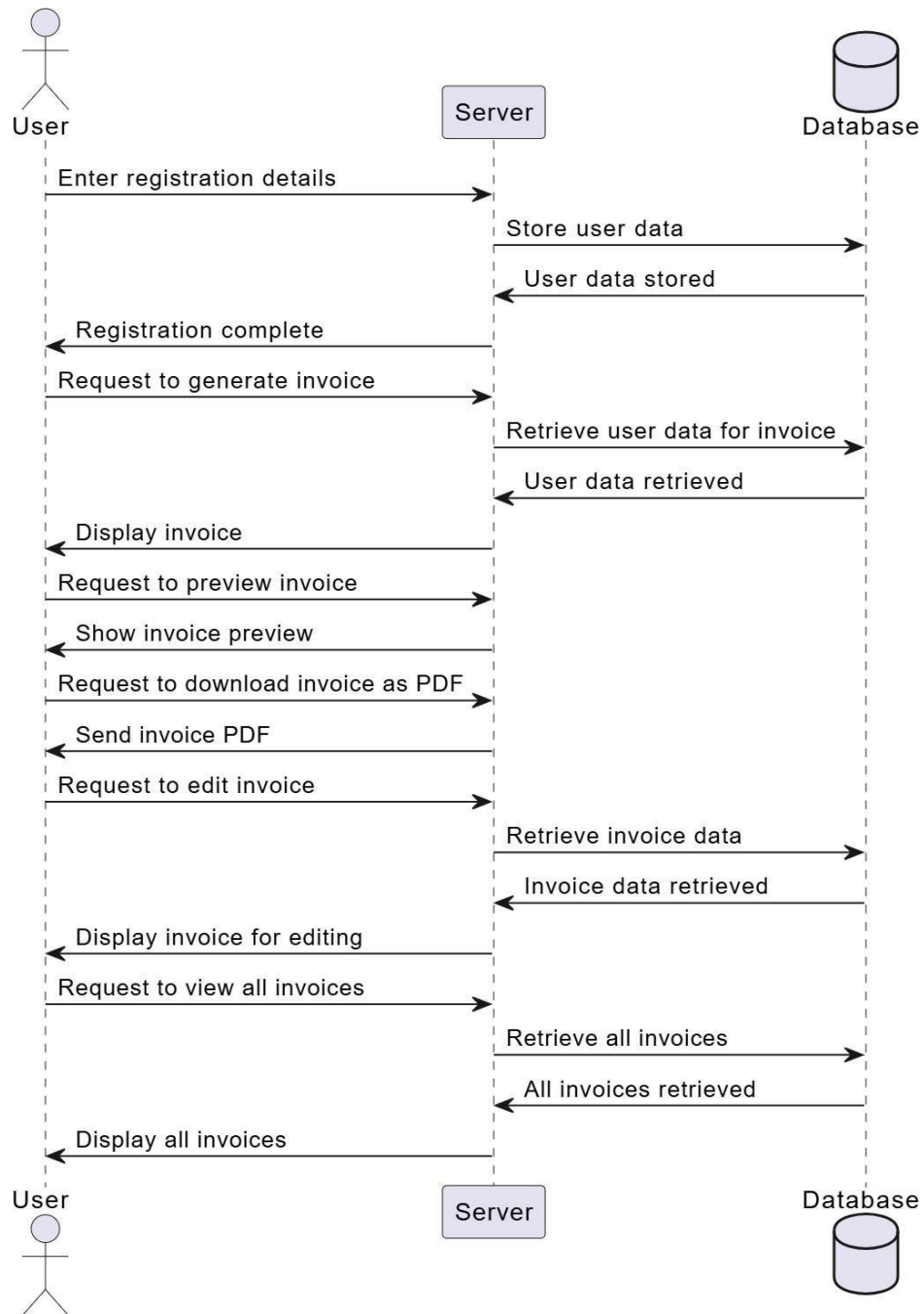




Fig 3.1 System Design Diagram



Demaze
Technologies

+ Add

List



Demaze
Technologies

D-814, Ganesh Glory 11,
Jagatpur Road, SG Highway,
Gota, Ahmedabad, 382470

Bill No: #5646

Date: MM/DD/YYYY

GSTIN Number : 24CEYPC9769J1ZK

HSN No : 99831

SEND INVOICE

PREVIEW

SAVE

Select Item

Price


Discount

Description

+ ADD ITEM

SERVICE DESCRIPTION		TOTAL
TITLE	ORIGINAL PRICE	0.00

Fig 3.2 Website page 1.1



Demaze
Technologies

+ Add

List

SERVICE DESCRIPTION		TOTAL
TITLE	ORIGINAL PRICE	0.00
Total Price		0.00
DISCOUNTED PRICE		0.00
GST (18%)		0.00
GRAND TOTAL		0.00

Contact To

Bank: BANK NAME
A/C no: 123456789012
Name: Demaze Technologies
IFSC Code: HDFCXXXXXXX
Phone: +91 7016660537

Company Detail

Company Name

Company Contact No

Company Email

Company Address

info@Demaze.in

Demaze.in

Fig 3.3 Website page 1.2

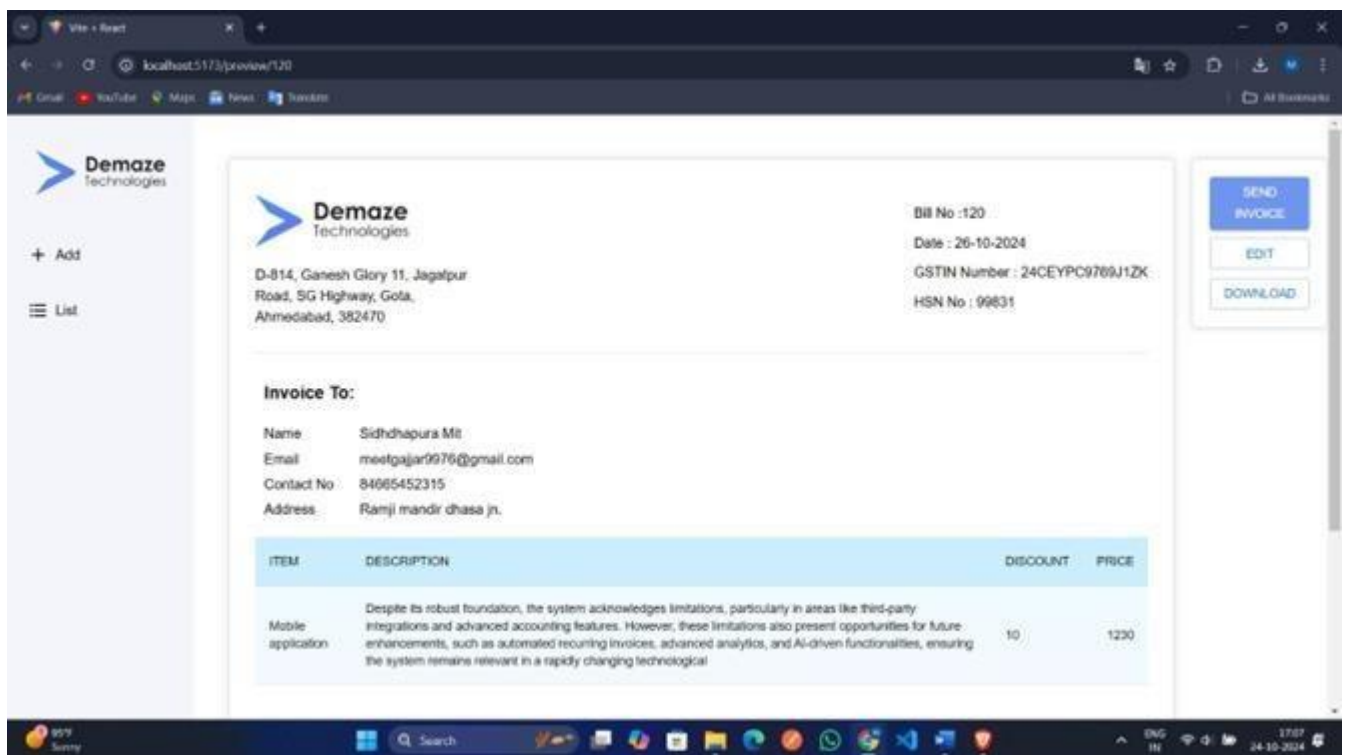


Fig 3.4 Website page 2.1

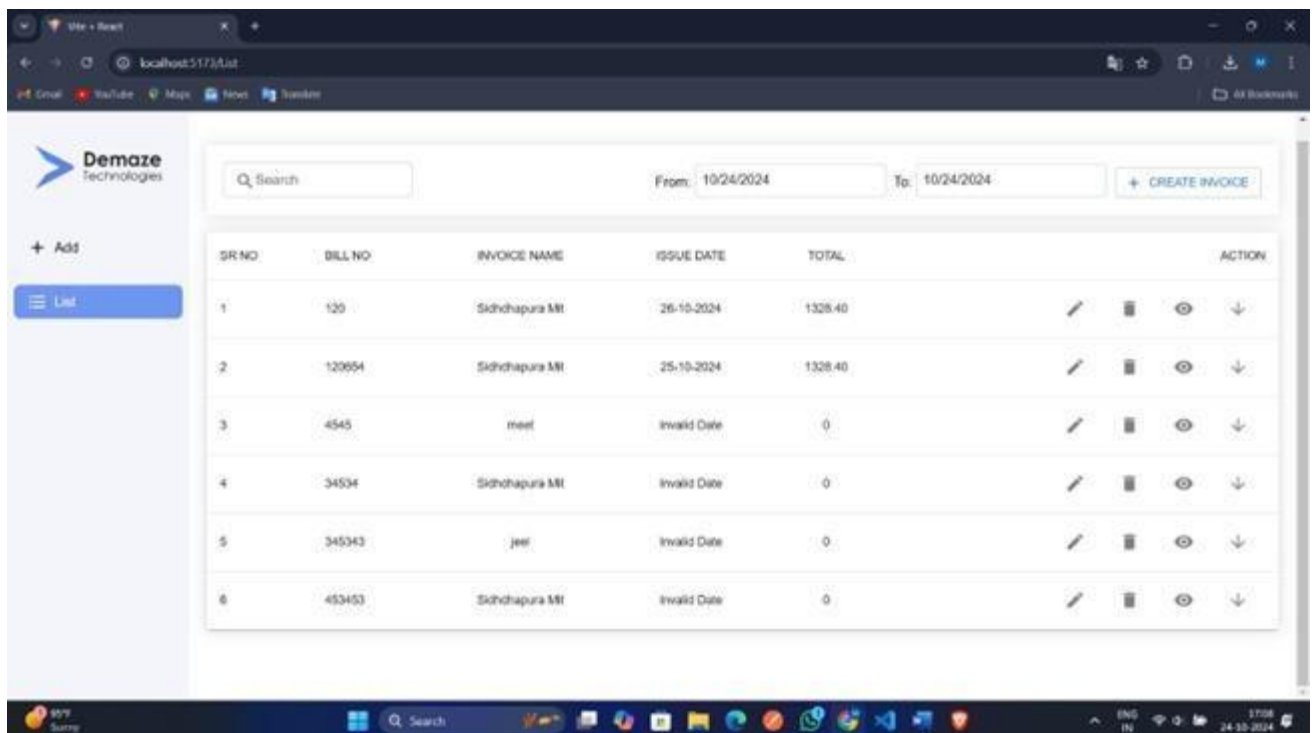


Fig 3.5 Website page 3.1

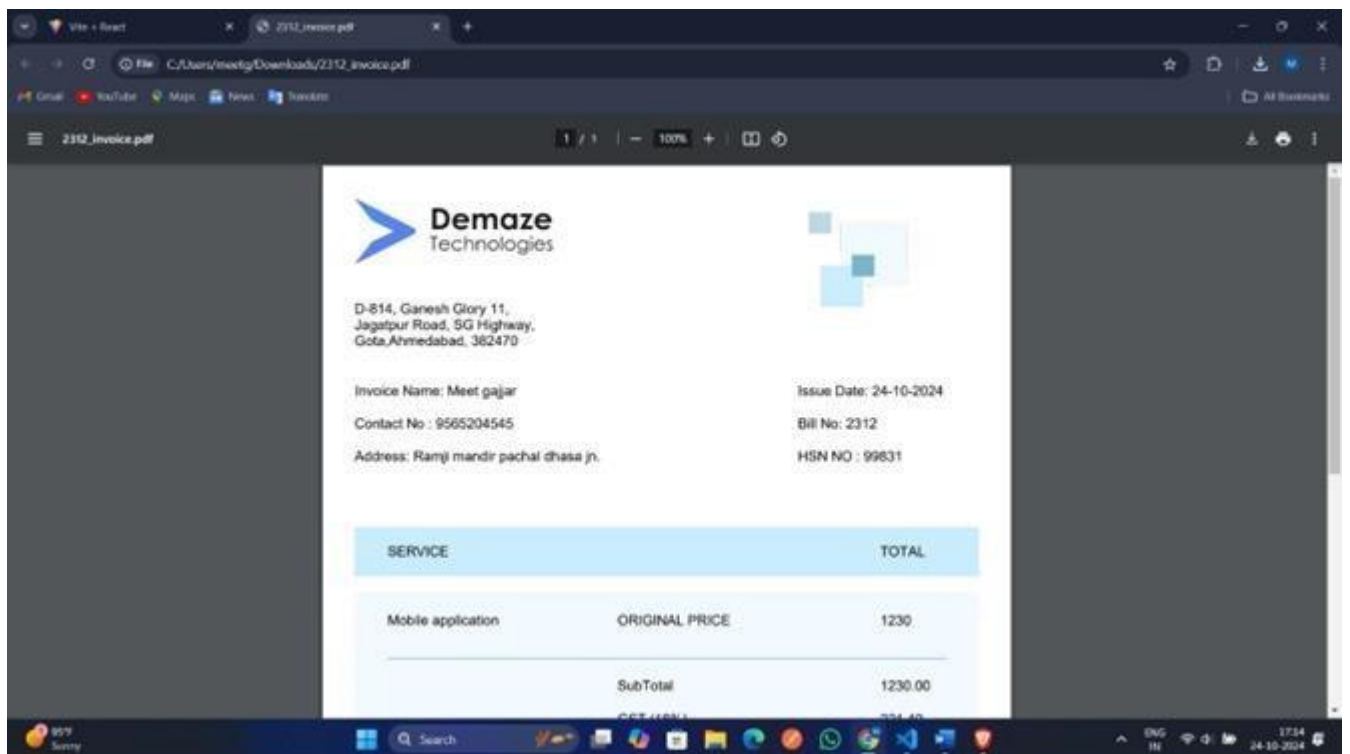


Fig 3.6 Website page 4.1

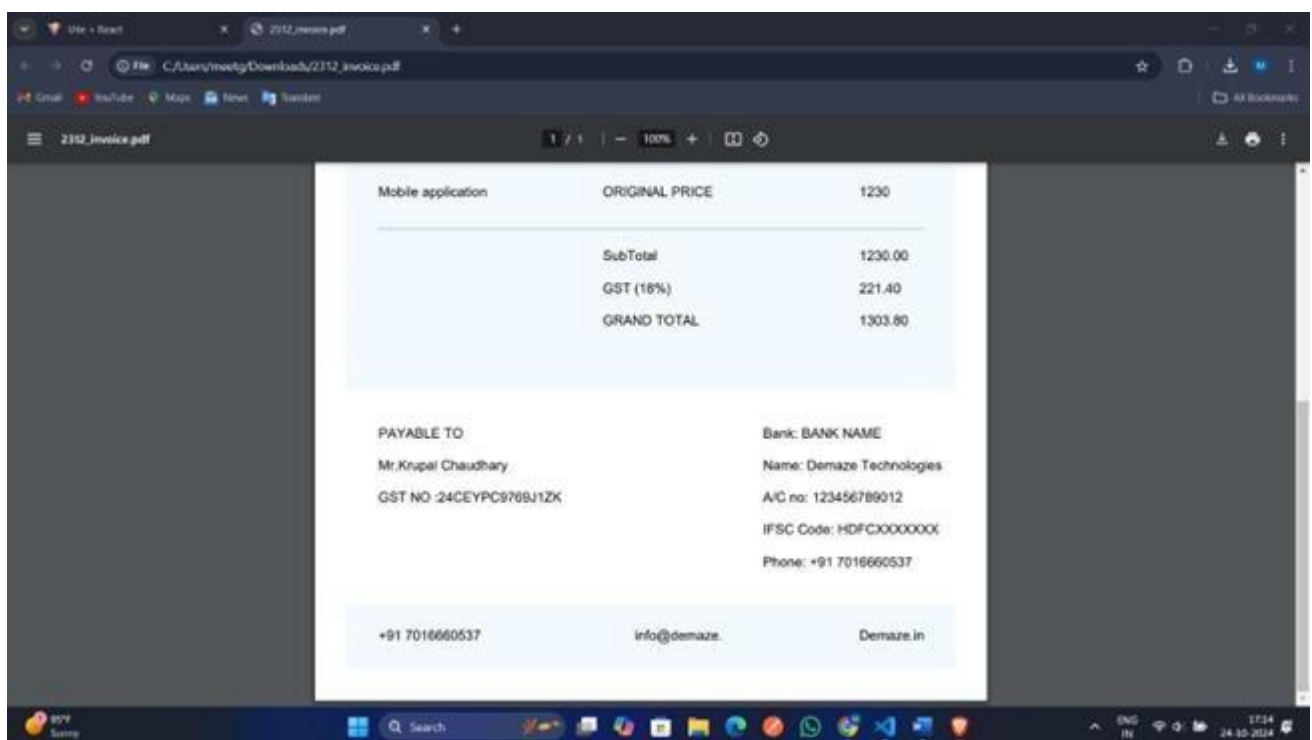


Fig 3.7 Website page 4.2

CHAPTER 4 : LIMITATION AND FUTURE ENHANCEMENT

- Despite the comprehensive features of the Invoice Generation System, several limitations must be acknowledged. One limitation is the absence of integration with third-party payment processing systems, which would streamline the payment collection process and enhance the overall functionality of the invoicing system. Additionally, the current version does not support advanced accounting features, such as profit and loss tracking or financial reporting, which could provide users with deeper insights into their financial performance. The system is also limited in its ability to handle multi-currency and multi-language support, which may restrict its usability for international clients or businesses operating in diverse markets.
- Another limitation is related to user authentication and role management. The current user management system is basic, and there may be a need for more robust access controls and user permissions to enhance security and operational efficiency. Moreover, the responsiveness of the user interface, while effective across common devices, may require further optimization for certain screen sizes or older devices, ensuring that all users have a consistent experience.
- Looking toward the future, several enhancements can be made to improve the system's functionality and user experience. Integrating third-party payment gateways could enable users to process payments directly through the invoicing system, facilitating faster transactions and better cash flow management. Expanding the accounting features to include comprehensive financial reporting, expense tracking, and analytics would provide users with valuable insights into their financial health.
- Implementing multi-currency and multi-language support would make the system more versatile and accessible to a broader audience, catering to businesses with international operations. Additionally, enhancing user authentication and role management features would improve security and allow for a more tailored user experience based on individual roles within a company.

CHAPTER 5: Diagrams

5.1 Class Diagram

User

- Attributes: userId, name, email, password.
- Methods: register(), login().
- Relationships:
 - Can have a Role (assigned to 0 or more roles).
 - Can be an Admin or PropertyOwner.
 - Can make Booking for a Property.
 - Can write a Blog.
 - Can use Search and Filter.

Role

- Attributes: roleId, name.
- Assigned to users, allowing users to have various roles (e.g., Admin, PropertyOwner).

Admin (inherits from User)

- Attributes: adminId.
- Methods: manageUsers() to handle user management tasks.

PropertyOwner (inherits from User)

- Attributes: ownerId.
- Methods: listProperty() to create listings for property

5.2 Class Diagram

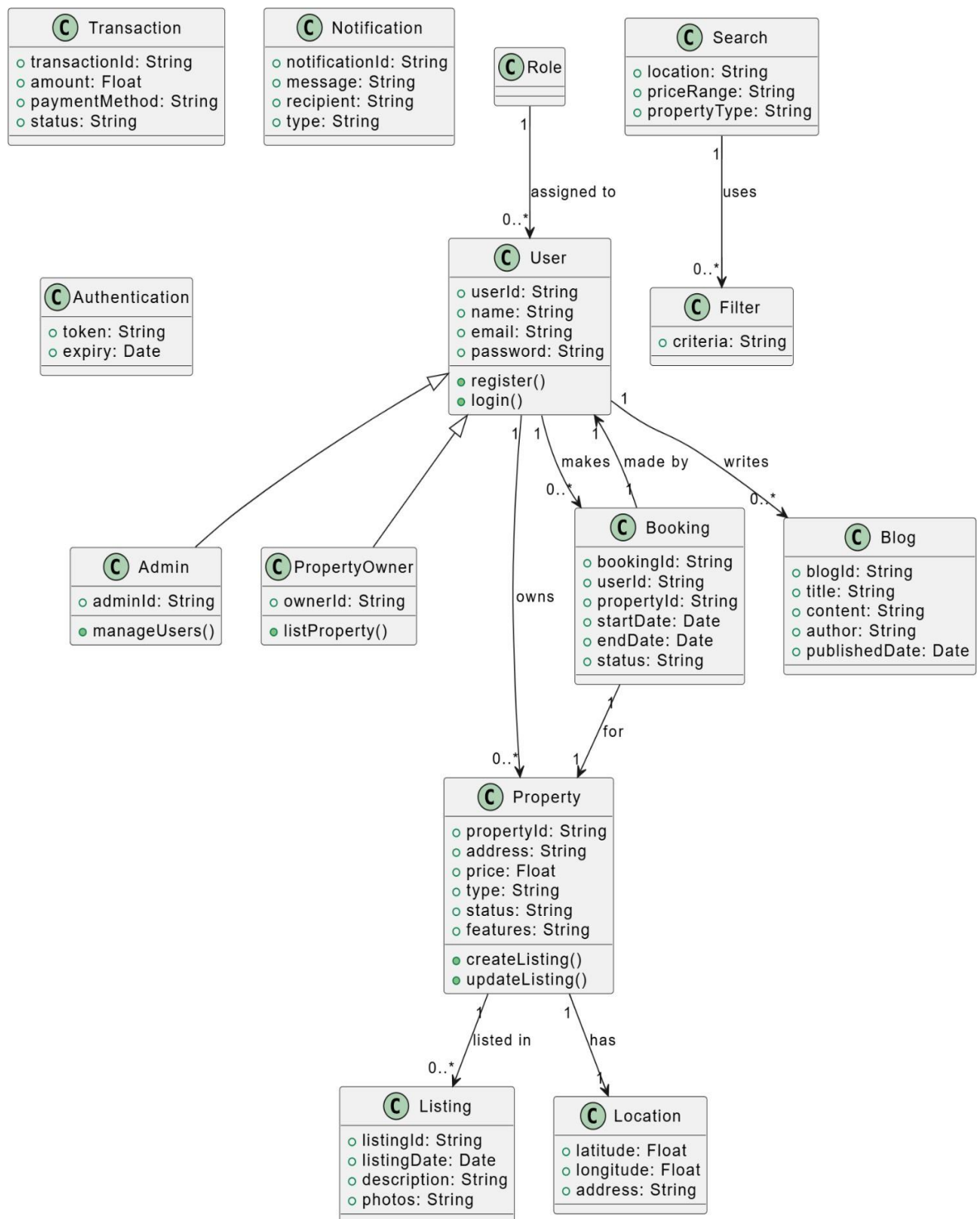


Fig 5.1 Class Diagram

5.2 End to End Sequence Diagram

User Actions

- **Initiate Search:**
 - The User initiates a search for properties.
 - This action leads to the Search for Properties use case, where they can view the search results.
- **Request Recommendations:**
 - After viewing search results, the User can request property recommendations.
 - The Recommendation Engine responds by suggesting properties that match the user's preferences or search criteria.
 - The user then receives the recommendations.
- **Request Booking:**
 - When the user finds a desirable property, they initiate a booking request.
 - This action triggers the Initiate Booking process.

5.3 End to End Sequence Diagram

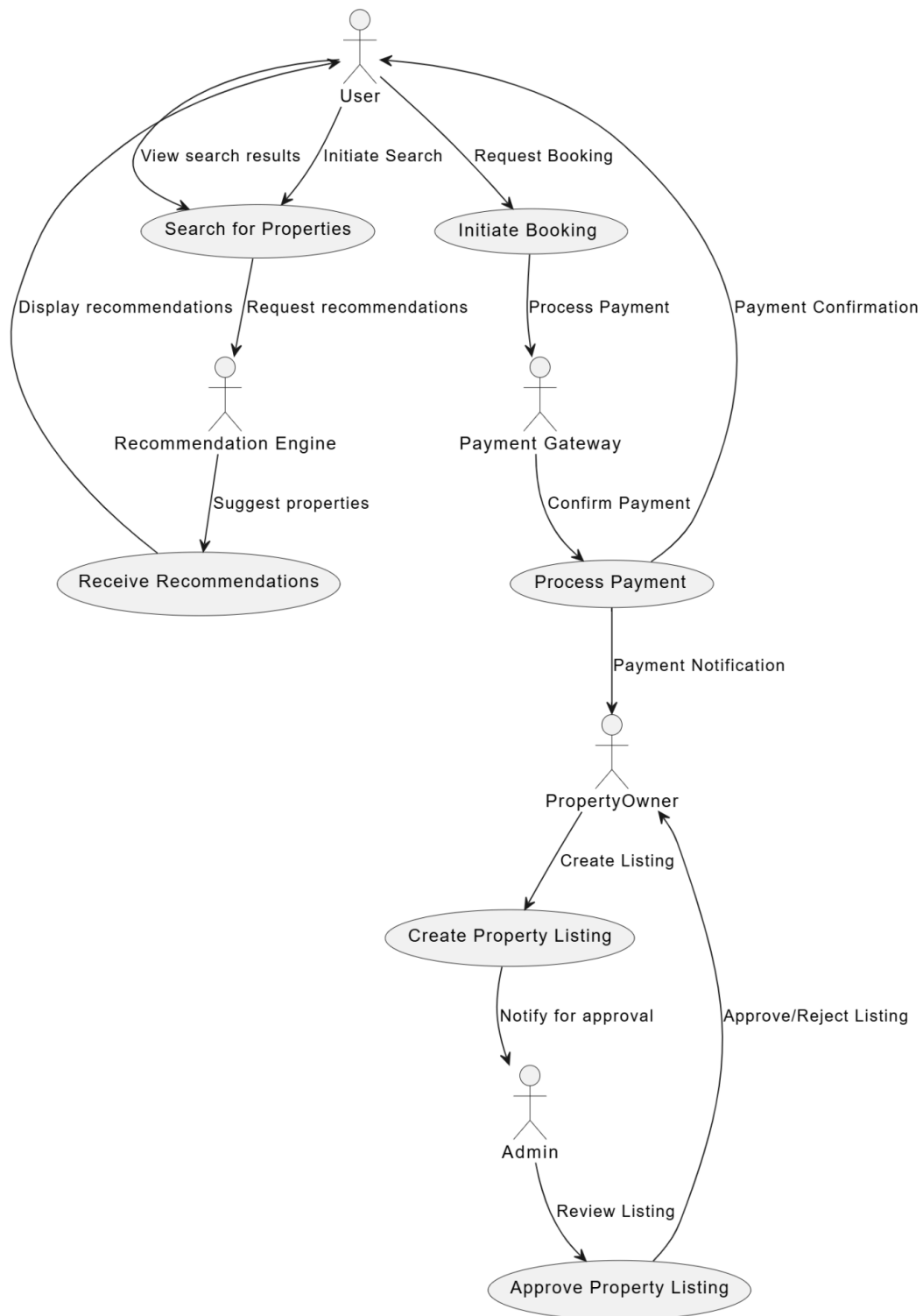


Fig 5.2 End to End Sequence Diagram

5.3 Advance Use Case Diagram

User Actions and Main Processes

- **Search for Properties:**
 - The user initiates a property search, viewing search results.
 - There's an option to request property recommendations.
 - A **Recommendation Engine** responds to the user's request by suggesting properties.
- **Initiate Booking:**
 - The user initiates a booking process.
 - This action triggers the **Payment Gateway** to process the payment.
 - Upon confirmation of payment, the user receives a **Payment Confirmation**.
- **Request Property Valuation:**
 - The user can request a property valuation.
 - This request is sent to the **Analytics Engine**, which analyzes the property data.
 - The user receives **Valuation Insights** once the analysis is complete.
- **Post in Community Forum:**
 - The user can post a question or query in a **Community Forum**.
 - This forum notifies other community members, who can respond to the query.
 - **Insights** are provided by the community, facilitating knowledge sharing.

5.3 Advance Use Case Diagram

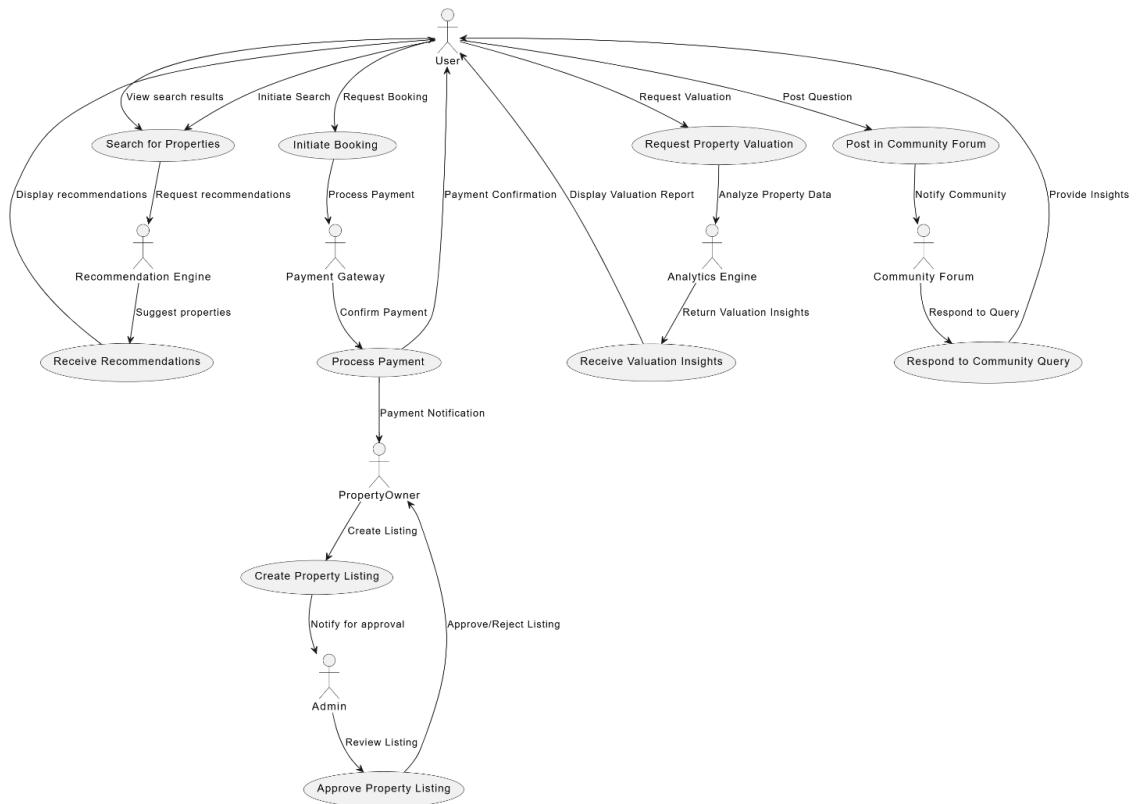


Fig 5.3 Advance Use Case Diagram

CHAPTER 6: API Integration

- **API integration is a crucial component of the Invoice Generation System, enabling the application to communicate with external services and enhance its functionality. This section outlines the various APIs that can be integrated into the system to improve user experience, streamline processes, and extend capabilities.**
- **One key area for API integration is payment processing. By integrating with payment gateways such as Stripe, PayPal, or Square, the system can facilitate direct payment transactions from invoices. This integration allows users to send invoices with payment links, enabling clients to pay online quickly and securely. The API would handle payment verification, updating invoice status, and notifying users of successful transactions, thereby improving cash flow and reducing manual follow-ups for payments.**
- **Another important integration involves cloud storage services like Google Drive, Dropbox, or Amazon S3. By implementing these APIs, users can automatically save generated invoices to their preferred cloud storage, ensuring secure backups and easy access to documents from any device. This functionality not only enhances data management but also provides users with peace of mind regarding document safety.**

CHAPTER 7 :Modular Design and Scalability

- The Invoice Generation System is developed with a modular design approach, which is essential for creating a flexible and maintainable application. This architecture allows different components of the system to be developed, tested, and updated independently, facilitating easier management and enhancement over time. Each module is responsible for specific functionalities, such as user authentication, invoice management, payment processing, and reporting. This separation of concerns not only improves code organization but also makes it easier to identify and resolve issues without impacting the entire system.
- The modular design enables the incorporation of new features or enhancements without significant rework of existing code. For example, if future requirements necessitate the addition of a new payment gateway, this can be achieved by creating a new module that interfaces with the existing payment processing component. This approach reduces development time and effort, allowing for quicker adaptations to changing business needs.

CHAPTER 8 : Time Line Chart

Requirement Gathering:

- Duration: 5 days
- Timeline: Days 1–15
- In this phase, the project team gathers and documents the project requirements.








Analysis:

- Duration: 20 days
- Timeline: Days 15–30
- This phase involves analyzing the requirements and defining project specifications.

Design:

- Duration: 10 days
- Timeline: Days 31–45
- The design phase focuses on creating the architecture and design documents for the system.

8.1 TimeLine Chart

Development Phase	90 Days						Duration (Day)
	1-15	15-30	31-45	46-60	61-75	76-90	
Requirement Gathering							5
Analysis							20
Design							10
Coding							40
Testing							10
Implementation & Deployment							5
Documentation							Parallel
Total Time (Days)							90

8.1 Time Line Chart

CHAPTER 9 : Conclusion

- The Invoice Generation System represents a significant advancement in the way businesses manage their invoicing processes. By leveraging modern technologies such as React, Material-UI, and Redux, the system provides a user-friendly interface that streamlines the creation, management, and distribution of invoices. The modular design ensures flexibility and maintainability, allowing for easy updates and the integration of new features as user needs evolve.
- Through its core functionalities—such as user authentication, invoice management, real-time previews, PDF generation, and customization options—the system addresses the essential requirements of businesses seeking efficient invoicing solutions. Moreover, the potential for API integrations with payment gateways, cloud storage services, and accounting software further enhances the system's capabilities, promoting a more seamless user experience.
- Despite its robust foundation, the system acknowledges limitations, particularly in areas like third-party integrations and advanced accounting features. However, these limitations also present opportunities for future enhancements, such as automated recurring invoices, advanced analytics, and AI-driven functionalities, ensuring the system remains relevant in a rapidly changing technological landscape.

CHAPTER 10: Future Implementation

- The Invoice Generation System is designed with a foundation that allows for future implementation of additional features and enhancements, ensuring it remains relevant and valuable to users as their needs evolve. Several potential areas for future implementation have been identified, each aimed at expanding the system's capabilities and improving user experience.
- One significant area for future implementation is the integration of advanced analytics and reporting tools. By incorporating data visualization libraries or business intelligence APIs, the system could provide users with detailed insights into their invoicing trends, payment patterns, and customer behaviors. This feature would empower users to make data-driven decisions, helping them optimize their invoicing processes and enhance overall business performance.
- Another important enhancement involves expanding the system's capabilities to support automated recurring invoices. This functionality would be particularly beneficial for businesses with subscription-based models or clients requiring regular billing. Users would be able to set up automated invoices that are generated and sent at specified intervals, reducing manual effort and ensuring timely billing.
- Enhancing the customization options for invoices is also a promising direction for future implementation. Users could be offered more flexible templates, allowing them to tailor invoices further to align with their branding and specific business requirements. This could include the ability to create multiple templates, adjust layouts dynamically, and personalize communication accompanying invoices.
- The implementation of artificial intelligence and machine learning technologies could bring additional value to the system. For instance, predictive analytics could forecast payment behaviors based on historical data, enabling businesses to proactively manage cash flow. Additionally, AI-driven tools could assist in automating data entry, reducing errors, and streamlining the invoicing process.
- Future versions of the system may also explore enhanced integration capabilities with various third-party applications. By expanding the list of supported integrations to include CRM systems, project management tools, and inventory management solutions, the Invoice Generation System could provide users with a more holistic view of their business operations. This would enable seamless data flow between different platforms, minimizing the need for manual data entry and enhancing overall efficiency.

Thank You