# INVENTO
## ONLINE INVENTORY MANAGEMENT SYSTEM

**A PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE AWARD OF THE DEGREE**

## MASTER OF COMPUTER APPLICATIONS (MCA)

**OF**

**MAHATMA GANDHI UNIVERSITY, KOTTAYAM**

**BY**


## AMIL DEV S
## Reg No: 22PMC111


MARIAN COLLEGE
KUTTIKKANAM
(AUTONOMOUS)

MAKING COMPLETE


**Marian College Kuttikanam Autonomous**

**Peermade, Kerala – 685 531**


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**Under the guidance of**

Mr. Satheesh Kumar
Assistant Professor
PG Department of Computer Applications
Marian College Kuttikkanam Autonomous

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# PG DEPARTMENT OF COMPUTER APPLICATIONS
## Marian College Kuttikkanam Autonomous
MAHATMA GANDHI UNIVERSITY, KOTTAYAM
KUTTIKKANAM – 685 531, KERALA.

# CERTIFICATE

This is to certify that the project work entitled

## INVENTO

is a bonafide record of work done by

## AMIL DEV S
**Reg. No.22PMC111**

In partial fulfilment of the requirements for the award of Degree of

## MASTER OF COMPUTER APPLICATIONS [MCA]

During the academic year 2022-2023

**Mr. Satheesh Kumar**
Assistant Professor
PG Department of Computer Applications
Marian College Kuttikkanam Autonomous

**Mr. Win Mathew John**
Head of the Department
PG Department of Computer Applications
Marian College Kuttikkanam Autonomous

**Examiner**

P.G. DEPARTMENT OF COMPUTER APPLICATIONS ★ MARIAN COLLEGE KUTTIKKANAM

**Examiner**

# ACKNOWLEDGEMENTS

“Gratitude is a feeling which is more eloquent than words, more silent than silence.” In undertaking this project, we needed the direction, assistance and cooperation of various individuals and organizations, which is received in abundance with grace of God, without their unconstrained support, the project could not have been completed. If words are considered as the symbol of approval and token of acknowledgement, then let the following words play the heralding role of expressing our gratitude. We wish to acknowledge our sincere gratitude to our Manager V Rev Fr Boby Alex Mannamplackal and Principal Prof Dr Ajimon George, Marian College Kuttikkanam (AUTONOMOUS), for all their efforts and administration in educating us in this premier institution. We extend our gratitude to Mr. Win Mathew John, Head of the Department of Computer Application, who is a constant source of inspiration and whose advice helped us to complete this project successfully. I express our deep sense of gratitude to our internal project guide, Mr. Satheesh Kumar, for his profound guidance for the successful completion of this project. With great enthusiasm we express our gratitude to all the faculty members of MCA department for their timely help and support. Finally, we express our deep appreciation to all our friends and family members for the moral support and encouragement they have given to complete this project successfully.

Amil Dev S

# ABSTRACT ON

# ONLINE INVENTORY MANAGEMENT SYSTEM

The Online Inventory Management System is a web-based app built with Django to automate inventory management. It ensures accurate tracking, reduces stockouts, and optimizes order fulfillment. Key features include real-time tracking, product management, and reporting. Staff can update product info, monitor stock levels, and receive low inventory alerts. The system leverages Django's capabilities for scalability and security, using models, views, and forms for data handling. It integrates with third-party libraries and APIs for enhanced functionality. Benefits include improved accuracy, optimized orders, and better decision-making. It reduces manual effort, streamlines operations, and provides real-time inventory overviews.

# TABLE OF CONTENT

# 1. PROJECT REQUIREMENTS

- User Management:
  The system incorporates two user roles: admin and staff. The admin user is exclusively responsible for registering new staff members. Admin users possess the authority to create and manage staff accounts, assigning roles and permissions. Staff users can securely log in using their credentials.

- Product Management:
  Admin and staff users should be able to add and delete products in the system. Both should have the ability to update product information, such as name, description, quantity, and category. The system should support the categorization of products for easier organization and searching.

- Inventory Tracking:
  The system incorporates real-time inventory tracking to monitor the available quantity of each product. Inventory levels are automatically updated when purchases occur or products are restocked. Both admin and staff users have the ability to view and search the current inventory levels for each product. Admin users receive alerts when inventory levels fall below a predefined threshold.

- Order Management:
  Admin and staff users can issue stock to customers. Both admin and staff users have access to view all orders within the system. For each order, invoices and SMS alerts are generated.

- Reporting and Analytics:
  Graphical representations, charts, and visualizations should be used to present data effectively.

# 2.FEATURES

# AND HIGHLIGHTS

- **Login functionality to secure the system:**
  Users, including staff and admin, will have individual login credentials to access the system. A secure login page will be available, featuring username and password fields. After successful authentication, users will be granted access to their corresponding roles and functionalities in the system.

- **Add, edit, and delete products in the inventory:**
  Admin and staff users can add new products to the inventory by providing details like name, category, reorder level, and quantity. Users have the option to edit existing product information to reflect any changes. If a product is no longer available, users can delete it from the inventory.

- **Real-time tracking of inventory levels and stock availability:**
  The system offers real-time tracking of inventory levels for each product. Users can easily view the current stock availability and quantity to facilitate efficient inventory management.

- **Alerts for low stock or out-of-stock items:**
  The system will generate alerts for admin and staff users when a product's stock falls below a predefined threshold. These alerts will enable users to promptly restock or reorder items, preventing stockouts and ensuring seamless operations.

- **Export available stocks to a CSV file:**
  The system generates alerts for admin and staff users when product stock falls below a predefined threshold. These alerts help users restock or reorder items promptly, preventing stockouts and ensuring smooth operations.

- **Update profile details of staff and admin:**
  Staff and admin users can update their profile information, including name, contact details, and profile picture. This feature enables users to keep their personal information up-to-date within the system.

- **Invoice generation for each issued product:**
  When an order is placed or a product is issued, the system automatically generates an invoice with details like product name, quantity, customer name, address, and phone number. Users have the option to print or save the invoice as a PDF for documentation and record-keeping purposes.

- **Generate visualized reports to analyse inventory levels:**
  The system generates reports that offer visual insights into inventory levels, including the current stock of each product. Graphs and charts are utilized to present the data in a visually appealing and user-friendly format.

- **SMS alerts to notify customers when stock is issued:**
  The system integrates with an SMS service provider to send automated SMS notifications to customers when their ordered products are issued or shipped. This feature enhances customer communication and provides real-time updates on their orders, improving overall customer satisfaction.

- **Mini chatbot to guide newly joined staff:**
  The system can incorporate a mini chatbot feature to assist newly joined staff members. The chatbot can provide basic information about the system, answer frequently asked questions, and guide users through common tasks. This feature enhances user onboarding and offers immediate assistance for staff members, improving their overall experience with the system.

# 3.TECHNICAL ASPECTS

## Django Libraries & Third party APIs

- **Admin Page: django-jazzmin:**
  Django-jazzmin is a customizable admin interface for Django projects. It offers a modern and responsive admin page with additional features and customization options. By utilizing django-jazzmin, the default Django admin interface can be enhanced and tailored to meet specific project requirements.

- **CSS: Bootstrap 5:**
  Bootstrap 5 is a widely used CSS framework that offers a variety of pre-built responsive components and utilities. It simplifies the design and styling of web pages, ensuring visual appeal and mobile-friendliness. Bootstrap 5 can be employed to create a consistent and professional user interface for the online inventory management system.

- **Forms: django-crispy-forms:**
  Django-crispy-forms is a Django package that facilitates the rendering of forms in a clean and elegant manner. It offers a means to define form layouts and styles using Python code or templates. By utilizing django-crispy-forms, the creation and customization of forms in the online inventory management system are simplified.

- **Login: django-registration-redux:**
  Django-registration-redux is a Django package that offers a flexible and customizable user registration and authentication system. It simplifies the integration of user registration, login, and password reset functionalities into the online inventory management system.

- **ChatBot: Dialogflow:**
  Dialogflow is a natural language understanding platform offered by Google. It allows the development of AI-powered chatbots and virtual assistants. By integrating Dialogflow into the online inventory management system, a chatbot feature can be implemented to assist users and address common queries.

- **SMS Alert: Twilio:**
  Twilio is a cloud communications platform that enables developers to send and receive SMS messages, make phone calls, and perform other communication tasks programmatically. By integrating Twilio into the online inventory management system, SMS alerts can be implemented, allowing the system to send automated notifications to users via SMS.

- **PDF Generation: reportlab:**
  Reportlab is a Python library designed for programmatically generating PDF documents. The reportlab library can be employed in the online inventory management system to generate invoices, receipts, or other PDF documents as needed.

- **Import & Export of Stock: django-import-export:**
  Django-import-export is a Django package that streamlines the import and export of data in multiple formats such as CSV, JSON, Excel, and more. It offers a user-friendly interface for importing and exporting stock data within the online inventory management system.

- **Visualization: Chartjs:**
  Chart.js is a JavaScript library that enables the creation of interactive and visually appealing charts and graphs. It supports multiple chart types such as bar charts, line charts, pie charts, and more. In the online inventory management system, Chart.js can be utilized to visually represent inventory data, sales trends, and other relevant information, facilitating data analysis and decision-making.

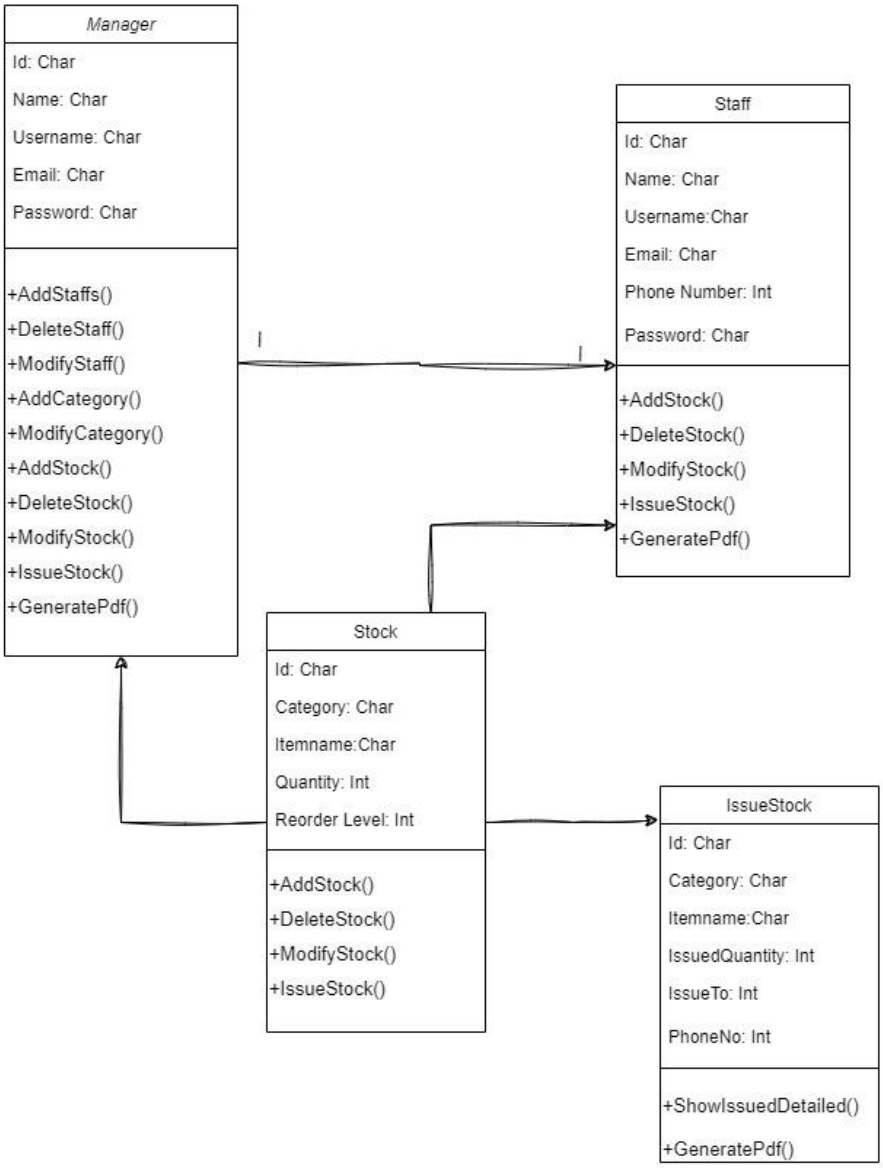
# 4. ARCHITECTURE OF THE PROJECT

# ARCHITECTURE OF THE PROJECT

- The Presentation Layer consists of a user interface (UI) built using HTML, CSS, and JavaScript. It includes templates for rendering dynamic content and views that handle user requests and responses.
- The Application Layer utilizes the Django Framework as the web application framework. It contains the business logic implementation, models representing inventory items, orders, users, etc., and forms for data validation and user input handling.
- The Database is implemented using a Relational Database Management System (MySQL). It consists of tables representing entities such as inventory, orders, users, etc., and establishes relationships between tables for data integrity.
- Authentication and Authorization functionalities include user login and logout, permissions and roles management, and user authentication using Django's built-in authentication system.
- The Inventory Management Module enables CRUD (Create, Read, Update, Delete) operations for managing inventory items. It tracks stock levels, quantities, and availability, and provides search and filtering capabilities.
- The Order Management Module facilitates the placing and processing of customer orders.
- The Reporting Module generates reports on inventory levels, sales, etc. It incorporates data visualization and analytics for better insights and allows exporting reports in various formats such as PDF and CSV.

# 5. DATABASE

# DATABASE (CLASS DIAGRAM)



# 6. CHALLENGES FACED DURING DEVELOPMENT

# CHALLENGES FACED DURING DEVELOPMENT

The system ensures accuracy and consistency of data by effectively managing data across different modules and database tables. It performs data validation and ensures data integrity during various operations, maintaining the reliability of the inventory system. Integration with Django libraries and third-party APIs enhances functionality and improves system integration with external systems. A user-friendly interface is created, prioritizing intuitiveness and ease of navigation for users, facilitating smooth system usage. The system strikes a balance between visually appealing design and functional requirements, ensuring an aesthetically pleasing and efficient user experience. Secure user authentication and authorization mechanisms are implemented to safeguard system access, protecting sensitive inventory data.

# 7. FUTURE ENHANCEMENT

# FUTURE ENHANCEMENT

We will develop a mobile application that provides on-the-go access to the inventory system, enabling users to manage their inventory anytime and anywhere. The mobile application will include barcode scanning functionality using mobile device cameras, allowing users to quickly identify products for efficient inventory management. To provide a comprehensive understanding of inventory levels, sales trends, and profitability, we will enhance the reporting capabilities of the system.

Furthermore, we will extend the system by incorporating warehouse management features, including location tracking, bin management, and stock transfers between warehouses. Utilizing historical data and market trends, the system will leverage predictive analytics to forecast future stock requirements, aiding users in optimizing inventory management strategies.

# 8. CONCLUSION

# CONCLUSION

In conclusion, the development of an Online Inventory Management System offers significant benefits to businesses in effectively managing their inventory, streamlining operations, and improving overall efficiency .

By implementing features such as real-time inventory tracking, the system provides accurate and up-to-date inventory information. The user-friendly interface ensures easy navigation and efficient management of stock . The project has leveraged the power of Django, a robust web framework, along with third-party libraries to achieve a scalable and secure solutions . It contributes to improved productivity and cost savings. By continually evolving and incorporating future enhancements, the system can adapt to the changing business landscape and ensure sustained growth and success.

GitHub Repository:
*https://github.com/amildev8547/Inventory-Management-System/tree/master/*

# 9.REFERENCES

# REFERENCES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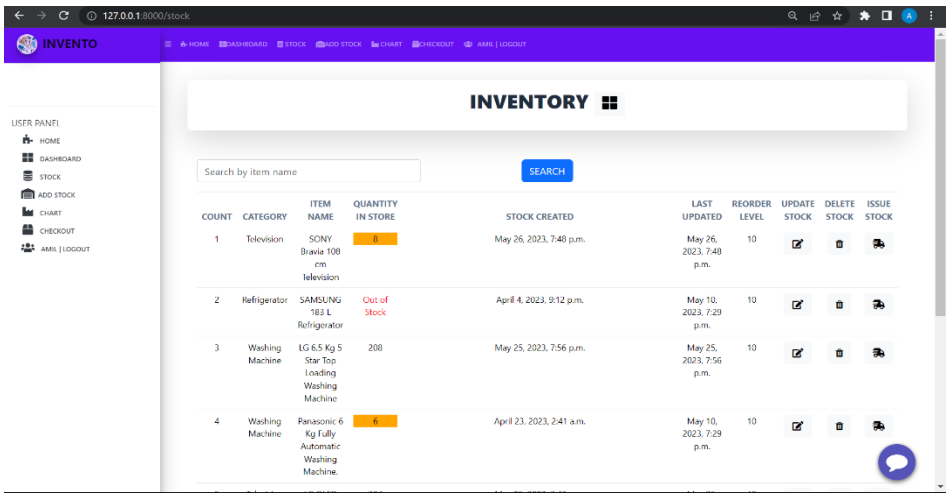
- https://developer.mozilla.org/en-US/docs/Learn/Server-side/Django
- https://djangopackages.org/
- https://pypi.org/
- https://chat.openai.com/
- https://dialogflow.cloud.google.com/
- https://www.twilio.com/en-us
- https://bard.google.com/

# 10. IMPORTANT SCREENSHOTS

# SCREENSHOTS WITH EXPLANATION

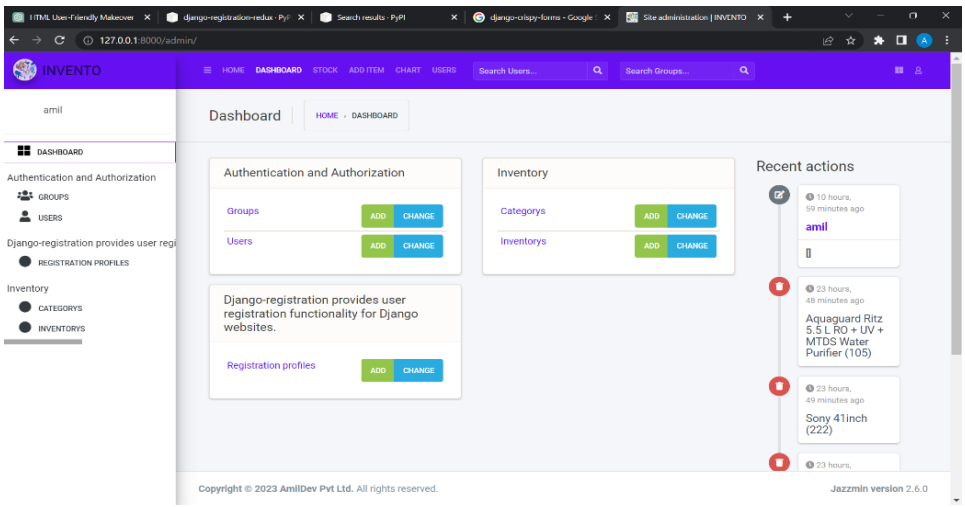
- **Stock Summary**

  Page shows the total stock that stored in the warehouse. It include add, update and delete stock details. The page also provide stock to issue to the customer.



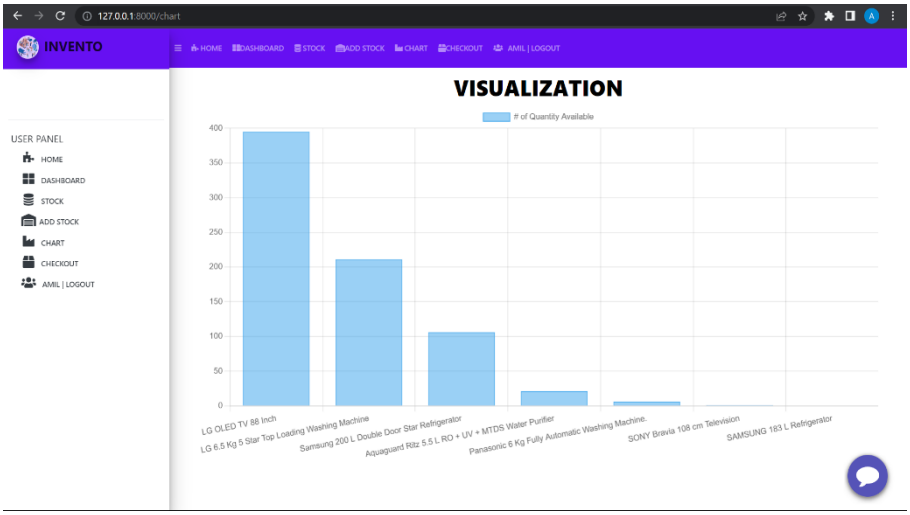

- **Admin Panel**

  Customised Django admin panel with Django-jazzmin library, which helps to make the user interface more interactive. It provides more facilities such as sidebar, logo, logo image, filter, show recent actions and so on.



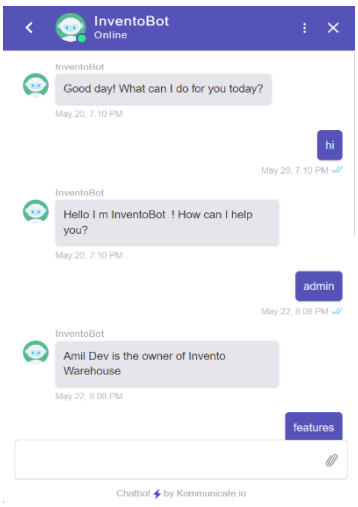
- **Visualization**

  This page provides the graphical visualization of the stock according to their quantity. Here I used Chartjs library to build the visualization and the chart used is Bar Graph.



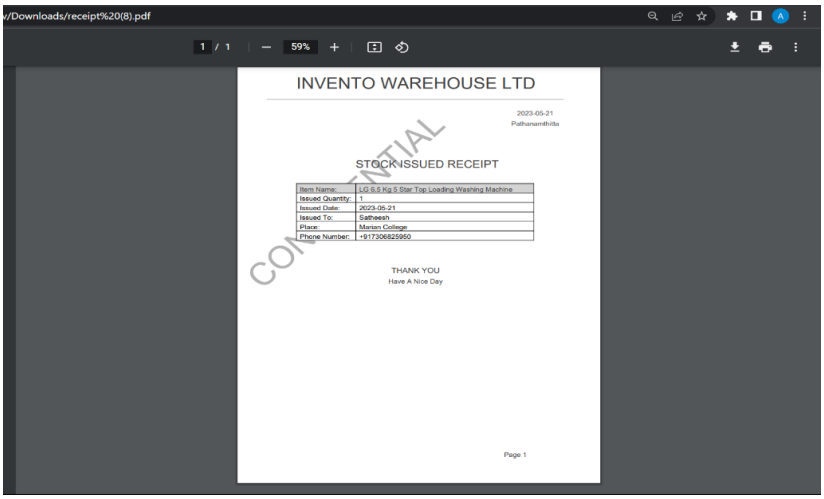

- **Mini ChatBot**

  Mini Chatbot is one of the interesting feature in the Online Inventory Management System. The main purpose of the chatbot is to provide guide for the newly joined staff to know the features and procedures of the website. Dialogflow ,owned by Google is used to build the chatbot with the help of Kommunicate.io



- **Stock Issue Receipt**

  When the stock is issued by the staff, the system will automatically provide a stock issued receipt, which is in the form of PDF. It includes the selected product, quantity, issued date, customer name and details .




- Stock Issued SMS

  If the stock issued successfully, an sms notification will send to the customer's phone number. It includes the customer details and the name of issued product with the number of quantity issued. SMS Notification is integrated with the help of Twilio, which is a third party API to provide notifications and calls etc.