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COURSE NAME: WEB APPLICATION DEVELOPMENT

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INVENTORY MANAGEMENT SYSTEM (WEB-BASED APPLICATION)

CASE STUDY: PATTY'S STORE

BY

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PROJECT REPORT 23RD MAY, 2024

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Introduction

In this report, I provide a comprehensive overview of my web development project, in which I developed an Inventory Management system website using Django as the backend framework. This project allowed me to immerse myself in web development, from design, development to functional implementation, while integrating the power of Django.

Project Background

Technology plays a significant role in various fields, including the business sector. Currently, manual systems are prevalent in stores, leading to errors and increased workload. The Inventory Management System is designed to enhance accuracy, speed, and efficiency.

Problem statement

Patty's Store currently relies on a paper-based system, making it challenging to manage inventories, track orders, and handle employee details.

Main Objective

The main objective is to design and implement a computerized inventory management system to improve efficiency at the store.

Motivation

Managing a retail shop efficiently is a challenging task that requires constant attention to detail, accurate record-keeping, and effective inventory control. My dad's shop (Patty's Store), like many small businesses, has been facing difficulties with manual inventory management, leading to challenges such as stockouts, overstocking, and inefficient tracking of products. These issues not only affect the shop's operational efficiency but also impact customer satisfaction and profitability.

The Inventory Management System project is motivated by the desire to transform Patty's Store into a more efficient, customer-focused, and growth-oriented business.

Literature review

No	Literature	Strength	Gap	Solution
1	Jayanth, S., Poorvi, M.B. and Sunil, M.P., 2017. Inventory management system using IOT. In <i>Proceedings of the First International Conference on Computational Intelligence and Informatics: ICCII 2016</i> (pp. 201-210). Springer Singapore.	Uses IOT	Expensive in terms of purchasing equipment	Develop a web-based solution
2	Madamidola, O.A., Daramola, O.A. and Akintola, K.G., 2017. Web-based intelligent inventory management system. <i>International Journal of Trend in Scientific Research and Development</i> , 1(4), pp.164-73.	Web-based Application	This system suites businesses operating on large scale as well as those with multiple warehouses	A web-based system suitable for retail shops operating on small scale

Table 1.Literature Review

Methodology

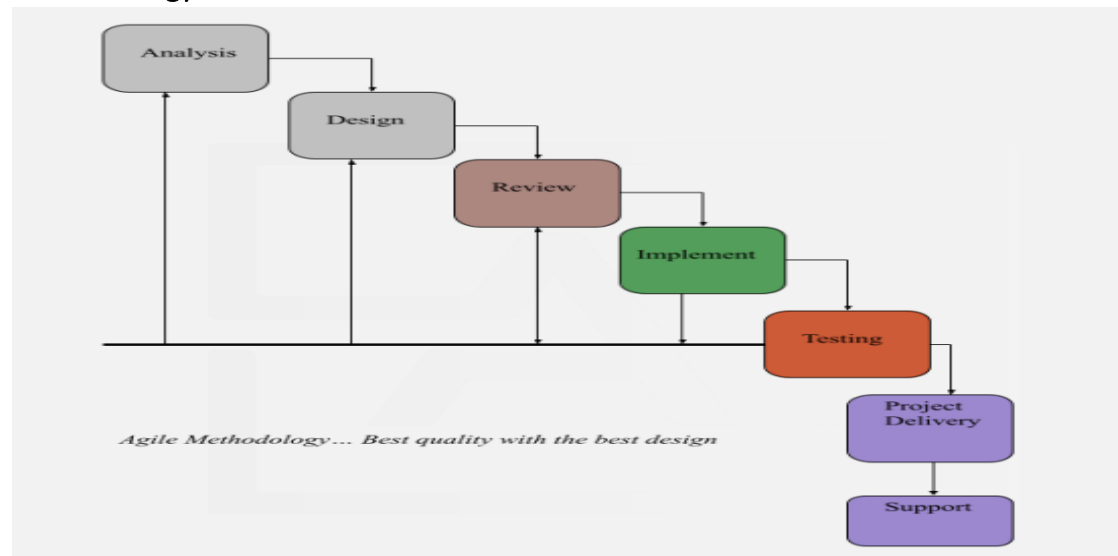


Figure 1.Agile Methodology

I followed the Agile Methodology for Project Management where we will divide the whole project into incremental, iterative work sequences that are commonly known as sprints.

Business Case

Functional Requirements

- Generate reports of all products available, employees, and customers.
- Monitor stock levels.
- Search and query for data in the database.
- Update profile data
- View Profile details

Non-Functional Requirements

- Data integrity through validation rules.
- Efficient and ease of usability of the system.
- Security through controlled access to the system.
- Reliability
- Availability

Design

Use Case Diagram

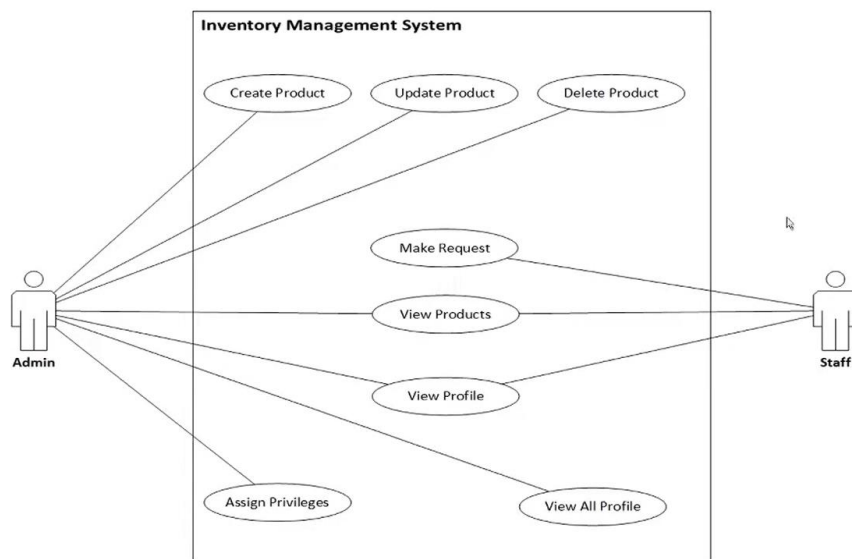


Figure 2 .Use case diagram

System Architecture

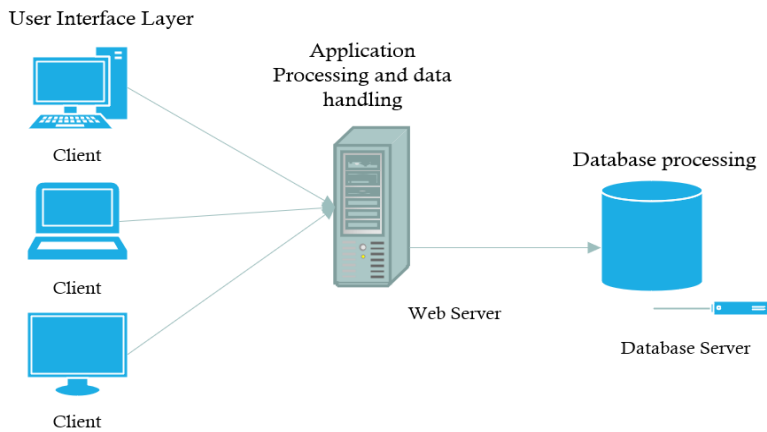


Figure 3. Three-tier architecture

Sequence Diagram

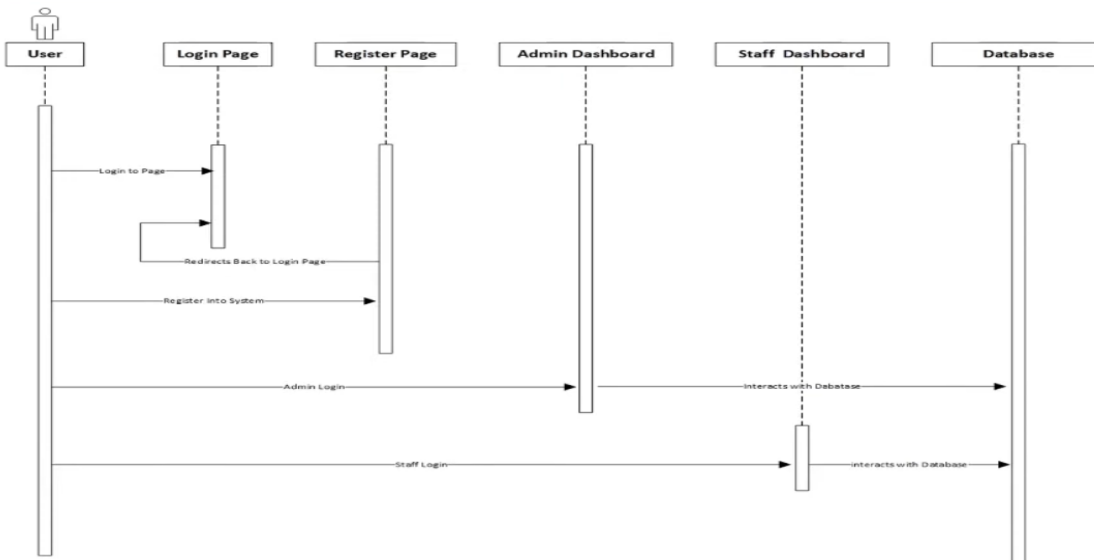


Figure 4. Sequence Diagram

Code Structure

Django's project and app structure naturally organizes code. I maintained separation between HTML templates, CSS, and JavaScript files within each app.

Testing

I extensively tested the websites on various devices and browsers to identify and address any layout issues, broken links, or JavaScript errors. Cross-browser compatibility was achieved through targeted testing and adjustments.

Implementation

The screenshot shows the top navigation bar of the application with the text "Patty's Inventory Management" on the left and "Register Login" on the right. Below the navigation bar is a white box titled "Login Page". Inside this box, there are two input fields: "Username*" and "Password*", each with a corresponding text input area. Below the password field, there is a green "Login" button and a blue link that says "Forgot password?".

Figure 5.Login Page

The login page is the primary interface for accessing the system, granting permission to other pages based on correct email and password. It determines the level of access authorization for each user, determining the page displayed.

This screenshot shows the same "Login Page" as Figure 5, but with an error message displayed in a red box at the top. The message reads: "Please enter a correct username and password. Note that both fields may be case-sensitive." Below the error message, the "Username*" field contains the text "Admin" and the "Password*" field contains six asterisks. The "Login" button and "Forgot password?" link are still present at the bottom.

Figure 6.Authentication

The screenshot shows the top navigation bar with "Patty's Inventory Management" and "Register Login". Below it is a white box titled "Registration Page". It contains four input fields: "Username*", "Email*", "Password*", and "Password confirmation*". Below the "Password*" field, there is a list of four bullet points providing password requirements: "Your password can't be too similar to your other personal information.", "Your password must contain at least 8 characters.", "Your password can't be a commonly used password.", and "Your password can't be entirely numeric." Below the "Password confirmation*" field, there is a small text label that says "Enter the same password as before, for verification." and a green "Register" button.

Figure 7.Staff Registration Page

Patty's Inventory Management Dashboard Admin Profile Logout

Registration Page

Username*
 ⓘ

A user with that username already exists.

Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.

Email*
Password*

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

Password confirmation*
 ⓘ

This password is too common.

Enter the same password as before, for verification.

Figure 8.username already exists & common password

Patty's Inventory Management Dashboard Patricia1 Profile Logout

Make Request
Product*
Order quantity*

Orders Records

Product	Category	Quantity	Date
Coffee	Food	2	May 10, 2024, 8:49 a.m.
Samsung TV	Electronics	1	May 10, 2024, 9:12 a.m.
Bag of Rice	Food	1	May 10, 2024, 9:17 a.m.
Samsung TV	Electronics	7	May 14, 2024, 7:16 a.m.
Pencils	Stationary	13	May 17, 2024, 7:01 a.m.
Coffee	Food	2	May 17, 2024, 7:04 a.m.

Figure 9.Staff view

Patty's Inventory Management Dashboard Patricia1 Profile Logout

Profile Page

Profile Information

Name Patricia1
Email adrikopatricia2@gmail.com
Phone 234567890
Address Kakoba

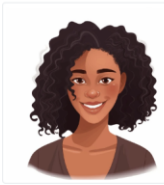


Figure 10.Logged in user Profile

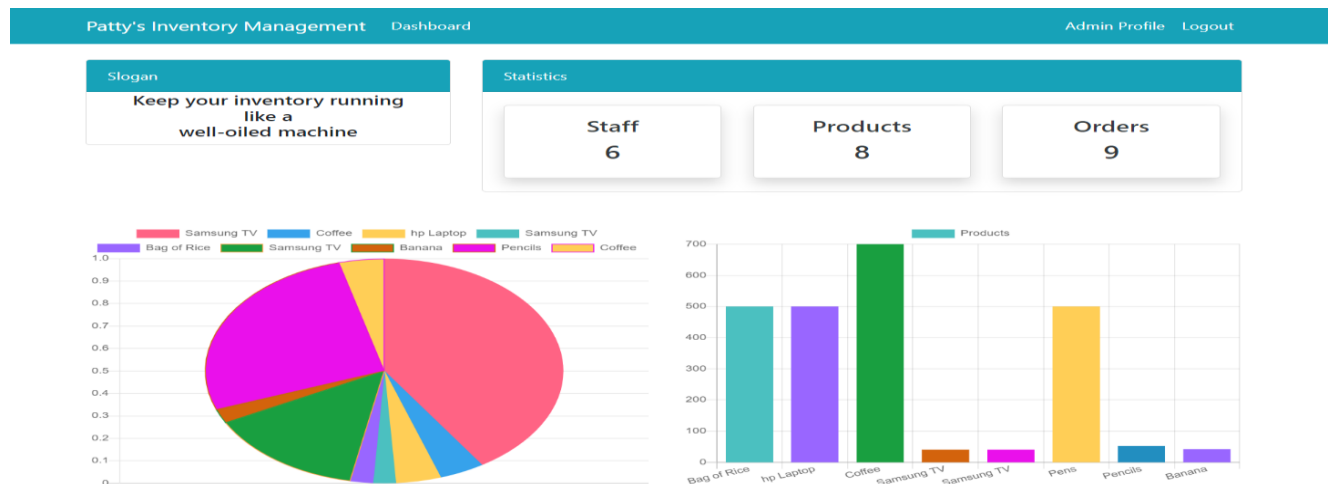


Figure 11. Admin Dashboard

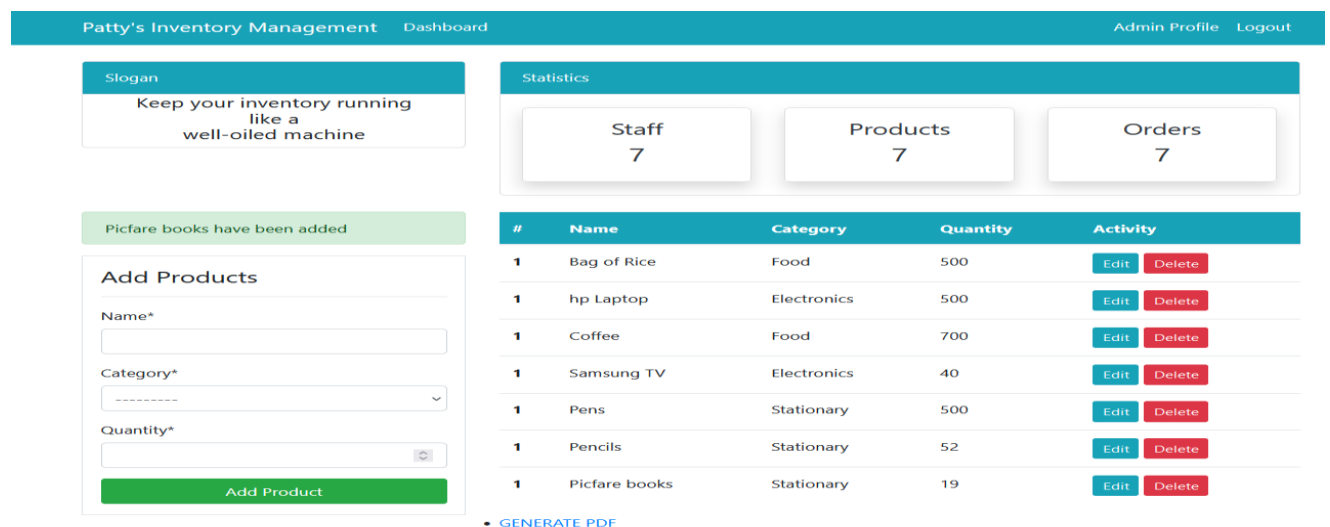


Figure 12. Product Page

Challenges faced during development

Risk management.

Evolving Requirements.

Managing project timelines.

Poor Communication.

Future Improvements

Use of Barcode as well as bar code reader.

Online Payment

Feedback from customers

Refine the animations and enhance the search functionality to provide more intuitive results.

Conclusion

Working on the Inventory Management system website with Django has enriched my web development skills, deepening my understanding of HTML, CSS, JavaScript, and Django. This project shown the value of attention to detail and responsive design in building user-friendly websites.

References

Jayanth, S., Poorvi, M.B. and Sunil, M.P., 2017. Inventory management system using IOT. In *Proceedings of the First International Conference on Computational Intelligence and Informatics: ICCII 2016* (pp. 201-210). Springer Singapore.

Madamidola, O.A., Daramola, O.A. and Akintola, K.G., 2017. Web-based intelligent inventory management system. *International Journal of Trend in Scientific Research and Development*, 1(4), pp.164-73.

<https://docs.djangoproject.com/>

<https://www.w3schools.com/django/>

Complete project available on

<https://github.com/adrikopatty/inventoryproject.git>