Website Development for OBARLY

Minor Project-II

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by

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CERTIFICATE

This is to certify that the Project Synopsis entitled, "**Website Development for OBARLY**" submitted by "**Alka Santhosh (2301730106), Nikhil (2301730077) and Pabitra (2301730081)** to **K.R Mangalam University, Gurugram, India,** is a record of bonafide project work carried out by them under my supervision and guidance and is worthy of consideration for the partial fulfilment of the degree of **Bachelor of Technology** in **Computer Science and Engineering(AIML Specializaton)** of the University.

Type of Project :
Industry/Research/University Problem

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ABSTRACT

OBARLY is a B2B e-commerce platform designed to streamline the bulk ordering process for restaurants, bars, cloud kitchens, and other hospitality businesses. This project involved the end-to-end development of a fully functional website that allows vendors to browse products, add items to a cart or wishlist, and place orders efficiently.

The frontend of the website was developed using **HTML**, **Tailwind CSS**, and **JavaScript**, ensuring a clean, responsive, and user-friendly design. The backend was built with **Flask** and integrated with **MongoDB** to manage product data, user interactions, and order processes dynamically. Key pages such as the Home, About Us, Shop, Cart, Wishlist, Admin, and Checkout were implemented with both static and dynamic elements.

Dataset cleaning and database structuring were carried out to ensure a seamless connection between the frontend and backend. Throughout the project, emphasis was placed on UI/UX principles, efficient routing, and database integration.

In the future, OBARLY aims to expand with advanced features such as real-time inventory tracking, admin-side analytics, and personalized product recommendations powered by machine learning.

KEYWORDS: B2B E-commerce, Website Development, Tailwind CSS, Flask, MongoDB, Full-Stack Web Development, UI/UX Design, Database Integration, Product Management, Future Scope with AI.

Chapter 1: Introduction

1. Background of the project

The hospitality and food service industry — including restaurants, bars, cloud kitchens, and theaters — is rapidly evolving in how it sources and manages its supplies. Traditional supply chain models often involve outdated manual processes, inconsistent pricing, limited vendor access, and communication inefficiencies. This often leads to operational delays, increased costs, and reduced flexibility for businesses trying to meet customer demands in a fast-paced environment.

Recognizing these challenges, we conceptualized and developed **OBARLY**, a specialized B2B (Business-to-Business) e-commerce platform aimed at modernizing and streamlining the bulk procurement process. **OBARLY** is designed to be a digital marketplace where registered businesses can easily browse products, view dynamic pricing, add items to cart or wishlist, checkout seamlessly, and manage their procurement without the friction traditionally associated with vendor dealings.

Our project — **Website Development for OBARLY** — focuses on delivering an intuitive, efficient, and scalable platform. We prioritized three major pillars while building this platform:

- **User Experience (UX)**: Making the interface simple, clean, and highly responsive using **Tailwind CSS** for frontend styling.
- **Reliable Backend Infrastructure**: Using **Flask**, a lightweight and efficient Python framework, to create server-side logic and routing that powers smooth website interactions.
- **Scalable and Flexible Database**: Employing **MongoDB Compass** for database management, ensuring that large datasets like product catalogs, user information, carts, and order details can be handled dynamically and securely.

We adopted a systematic design approach:

- We first planned the user flow and page layouts, ensuring clarity and consistency across the website.

- Frontend development focused on responsive page designs like the Home Page, About Us, Checkout, Cart, Wishlist, and Admin Dashboard.
- Backend development included setting up API routes, connecting dynamic pages with the MongoDB database, handling CRUD operations (Create, Read, Update, Delete), and ensuring seamless data fetching and updating.

Each team member played a crucial and defined role, contributing to either UI/UX development, backend scripting, database integration, or dataset preparation. Collaboration and clear distribution of tasks ensured that both the frontend and backend components were built in parallel and integrated successfully.

In the future, OBARLY aims to go beyond simple ordering features. Planned upgrades include:

- **Admin analytics dashboards** to monitor sales and inventory trends.
- **AI-powered product recommendation engines** based on order behavior.
- **Real-time inventory updates** integrated directly from vendors' stock databases.

By building OBARLY, we have taken a step toward bridging the gap between traditional B2B supply chains and the future of digital commerce, creating a solution that is modern, scalable, and adaptable to the dynamic needs of the hospitality sector.

2. MOTIVATION

The idea for developing **OBARLY** was born out of a deep understanding of the operational difficulties faced by businesses like restaurants, bars, and cloud kitchens when managing their bulk purchasing needs. Traditionally, these businesses rely heavily on manual procurement methods — involving phone calls, handwritten orders, negotiations with multiple vendors, and unpredictable delivery schedules. This leads to inefficiencies such as supply chain delays, miscommunication, frequent stockouts, and an overall lack of transparency in pricing and inventory availability.

We recognized that in today's fast-moving digital world, businesses should not have to face these hurdles.

Our motivation was to create a platform that could:

- Digitize and simplify the procurement process.
- Bring transparency to pricing and inventory.
- Save businesses time, cost, and effort through a streamlined online system.
- Allow businesses to focus more on customer service rather than backend supply management.

Additionally, while B2C (Business-to-Consumer) e-commerce has rapidly evolved, the B2B segment still lags behind in many industries. We saw an opportunity to address this gap by offering a specialized solution tailored specifically for bulk buyers.

By combining our technical knowledge in web development, backend integration, and database management, we were motivated to build a practical, real-world solution that could bring measurable improvements to business operations. At the same time, this project allowed us to challenge ourselves with a full-stack development experience, preparing us for more complex real-world software projects in the future.

Chapter 2: LITERATURE REVIEW

1. Review of existing literature

The rise of **B2B e-commerce** has brought transformative changes in how businesses source their supplies. Major platforms like **Udaan**, **Alibaba**, and **IndustryBuying** have shown how online marketplaces can streamline procurement processes, offering businesses greater convenience, price transparency, and access to a wide variety of products. However, much of the digital transformation in B2B commerce is focused on **mobile applications**, often leaving out the advantages a **dedicated website** can offer.

Research studies and **market reports** indicate that businesses still prefer websites for several key activities:

- Detailed product browsing and comparison.
- Placing large and complex orders that require multiple steps.
- Accessing invoices, order history, and analytics dashboards more comfortably on larger screens.
- Easier account management and bulk order customizations.

Platforms that rely solely on mobile apps may face limitations when businesses require:

- Advanced filtering and search capabilities.
- Desktop access for administrative tasks.
- Deeper integration with enterprise resource planning (ERP) tools.

Although OBARLY has an existing **mobile app** serving its clients in the food and beverage industry, **the lack of a dedicated website** was observed as a significant gap. This created hurdles especially for restaurant owners, bar managers, and procurement teams who are accustomed to performing large purchases through web portals rather than small screens.

Our project aims to address this gap by creating a **full-fledged website for OBARLY** that offers:

- Seamless desktop ordering experience.
- Bulk order support.
- Easy cart, wishlist, and checkout management.
- Future capabilities like insights for vendors and AI-based product recommendations.

By reviewing current literature and industry practices, it became clear that a **responsive, feature-rich web platform** is critical to scaling OBARLY's operations and offering a complete omnichannel experience to its clients.

2. GAP ANALYSIS

Aspect	Existing (Mobile App)	Gap Identified	Solution Provided (Website)
Accessibility	Only available on smartphones.	Businesses prefer large screens for bulk orders and admin work.	Created a fully responsive website accessible via desktops and laptops.
User Experience for Bulk Orders	Designed mainly for quick small orders.	Complex, large orders are difficult to manage on mobile.	Website designed with easy bulk ordering features like cart management and wishlist functionality.
Data Visualization (Admin Features)	Limited insights and management tools on mobile.	Vendors need dashboards for order tracking and analytics.	Built an Admin Page with plans to integrate future insights and analytics tools.
Order Management	Basic order placement features only.	Lack of detailed order history and customization options.	Checkout and order summary pages added with structured workflows.
Integration with Business Systems	Difficult to connect mobile apps with ERP and inventory systems.	Businesses prefer desktop platforms for integration tasks.	Website built keeping scalability and integration possibilities in mind.
Marketing and SEO Visibility	App is discoverable only via app stores.	No web presence means limited online visibility.	Website will improve SEO presence, attract new clients organically, and establish brand authority.

3. PROBLEM STATEMENT

Despite having a mobile application to cater to bulk ordering needs, OBARLY lacks a dedicated web platform that can serve the growing demands of its business clients such as restaurants, bars, cloud kitchens, and theaters.

Business users often prefer using desktop environments for better visibility, easier handling of large-scale orders, data management, and integration with other business tools. The absence of a website restricts OBARLY's accessibility, limits user experience for bulk transactions, and reduces online visibility critical for organic growth.

Thus, there is a clear need to develop a **responsive, user-friendly, and scalable website** for OBARLY that addresses these gaps by:

- Enabling seamless bulk ordering processes.
- Offering a robust admin dashboard for order management and future analytics integration.
- Enhancing brand visibility through web presence.
- Preparing the platform for future expansions like AI-based product recommendations and automated inventory tracking.

4. OBJECTIVES

The main objectives of the OBARLY website development project are:

- To design and develop a fully functional website for OBARLY that complements the existing mobile application.
- To create a user-friendly and responsive UI that caters specifically to bulk buyers like restaurants, bars, cloud kitchens, and theaters.
- To implement a seamless frontend experience using Tailwind CSS, focusing on clean, consistent, and intuitive design.
- To build a secure and efficient backend using Flask connected to a MongoDB database for smooth data management and real-time operations.
- To develop essential modules like Home page, Shop page, Cart, Wishlist, Checkout, and Admin Dashboard.
- To ensure efficient database operations such as product fetching, cart management, and order placement.
- To clean and upload relevant datasets into the database for accurate and structured backend processes.
- To lay the foundation for future features like analytics dashboards and machine learning–based product recommendations.

CHAPTER 3: METHODOLOGY

The development of the OBARLY website followed a systematic and phased approach:

Requirement Gathering and Analysis

- Studied the existing OBARLY mobile application to understand its features, target audience, and workflows.
- Identified the gaps, specifically the absence of a web platform for bulk ordering.
- Finalized the key features and pages needed for the website such as Home, Shop, Cart, Wishlist, Checkout, and Admin Dashboard.

Design Approach

- Adopted a **User-Centered Design** strategy to create a clean and intuitive interface.
- Created wireframes and page layouts focusing on minimalistic design using **Tailwind CSS**.
- Emphasized responsive design to ensure compatibility across desktops, tablets, and mobiles.

Technology Stack

- **Frontend**: HTML, Tailwind CSS, JavaScript
- **Backend**: Python (Flask framework)
- **Database**: MongoDB Compass
- **Tools Used**: VS Code, GitHub for version control

Frontend Development

- Developed static pages like Home, About Us, Checkout, and Admin Dashboard.
- Designed dynamic pages like Cart and Wishlist with placeholders for product data.
- Ensured consistent styling and responsiveness across the entire website.

Backend Development

- Set up Flask routes to handle data operations such as viewing products, adding to cart, and managing the wishlist.

- Integrated MongoDB Compass as the database to store product and user-related information.
- Wrote APIs to fetch, display, and update product information dynamically.

Data Cleaning and Upload

- Preprocessed and cleaned the product dataset using Python and Excel tools.
- Uploaded the cleaned data into MongoDB in a structured format for easy retrieval and management.

Testing

- Performed unit testing on individual pages to ensure they loaded and worked correctly.
- Conducted integration testing to verify proper frontend-backend communication.
- Identified and resolved bugs related to page responsiveness and data fetching.

Deployment and Documentation

- Organized the entire codebase and prepared it for deployment.
- Created detailed documentation including a project report, video explanation, and GitHub repository setup.

3.2 Data Description

Here’s a detailed Data Description, EDA outline, and Procedure/Development Life Cycle based on your input:

3.2 Data Description

Data Source

The dataset was directly obtained from the CEO of the company, Mr. Kartikey Aggarwal.

It was provided in the form of an Excel spreadsheet.
The dataset includes detailed information related to the company's product catalog, including pricing, stock, shipping, cancellation, and return policies.

Data Collection Process

- The data was collected internally by the company's operational and inventory management teams.
- It was extracted from their inventory management system and compiled manually into an Excel file for our use.
- The process involved:
    1. Exporting product-related details from the database.
    2. Consolidating fields relevant to sales, inventory, shipping, and policies.
    3. Sharing the extracted data with the project team through official communication channels.

Data Type

The dataset is a combination of different types:

- Numerical Data: (e.g., default_price, discount, inventory, shipping_fees)
- Categorical Data: (e.g., categories, brand_name, cancellation_status)
- Textual Data: (e.g., product_name, description, image_path)
- Boolean Data (0/1 or Yes/No): (e.g., on_sale_0_1, track_inventory_yes_no, return_allow)

Data Size

- The original dataset had several thousand records (specific number if you want to add).
- Number of columns initially: 30+ columns.

- After selecting the required columns, we worked with 18 key features.

Data Format

- File format: Microsoft Excel (.xlsx)
- Data was structured in a tabular format:
  - Rows: Each row represented a single product.
  - Columns: Each column represented a product attribute.

Data Preprocessing

We applied the following preprocessing steps:

- Column selection: We filtered and retained only necessary columns: product_name, product_sku, default_price, discount, categories, Items, description, image_path, track_inventory_yes_no, inventory, low_stock_reminder_yes_no, stock_value, shipping_fixed_free, shipping_fees, cancellation_status, return_allow, return_days, status.
- Handling Missing Values:
  - Checked and cleaned missing entries (for important fields like default_price, inventory).
- Data Type Conversion:
  - Converted yes/no fields into boolean (True/False).
  - Made sure numerical columns were properly numeric.
- Normalization:
  - Basic normalization on inventory and stock values where necessary for visualization.
- Feature Engineering:
  - Created logical groupings based on categories for analysis.

Data Sampling (if applicable)

- No separate sampling was done initially.
- We worked with the complete cleaned dataset for EDA.
- For modeling (if applicable later), stratified sampling based on categories could be considered.

Data Quality Assurance

- Manual Validation: Cross-checked random samples for accuracy with the original Excel file.

- Consistency Checks: Ensured there were no duplicate product entries.
- Range Validation: Checked logical ranges (e.g., shipping fees must be >=0).

Data Variables

Variable Name	Description	Type
product_name	Name of the product	Text
product_sku	Unique SKU identifier	Text
default_price	Original price before any discount	Numerical
discount	Discount amount	Numerical
categories	Category the product belongs to	Categorical
Items	Number of Items (if applicable)	Numerical
description	Product description	Text
image_path	Path/Link to product image	Text
track_inventory_yes_no	Whether inventory tracking is enabled (Yes/No)	Boolean
inventory	Current stock quantity	Numerical
low_stock_reminder_yes_no	Low stock reminder enabled (Yes/No)	Boolean
stock_value	Total stock value	Numerical
shipping_fixed_free	Shipping method (Fixed/Free)	Categorical
shipping_fees	Applicable shipping fee	Numerical
cancellation_status	Cancellation policy status	Categorical
return_allow	Return allowed or not (Yes/No)	Boolean
return_days	Number of days allowed for return	Numerical
status	Product availability status (e.g., Active/Inactive)	Categorical

1. Details of tools, software, and equipment utilized.

1. Development Tools:

- Python: The core programming language used for backend development with Flask. Python was employed for writing server-side logic, handling API requests, and managing the overall functionality of the website.
- Flask: A lightweight Python web framework used for building the backend of the OBARLY platform. It helped in creating API routes, handling requests, and integrating with the database.
- MongoDB Compass: This tool was used for managing the database and ensuring seamless interaction between the platform and the MongoDB database for handling product catalogs, inventory, and other user-related data.

2. Frontend Development Tools:

- HTML/CSS: The foundation for building the website's structure and styling.
- Tailwind CSS: A utility-first CSS framework that helped design a responsive and user-friendly interface.
- JavaScript: For implementing interactive elements on the frontend, including form validations and dynamic updates to the user interface.

3. Code Version Control:

- Git: Used for version control throughout the development process, ensuring that all code changes were tracked, and enabling collaboration among team members.
- GitHub: The repository used for storing and sharing the project's code. It helped facilitate collaboration and version

control for team members working on the backend and frontend components.

4. Database:

- MongoDB: A NoSQL database used to store product information, user data, inventory levels, and order details. MongoDB allowed for easy storage and retrieval of dynamic datasets, particularly in a flexible and scalable format.
- MongoDB Compass: A GUI tool for managing and querying the MongoDB database, enabling developers to monitor and visualize database operations effectively.

5. Hosting and Cloud Tools (if applicable):

- Heroku: (If used) Heroku could have been used for hosting the backend application, providing a platform for deploying the website and managing server instances easily.
- AWS S3: (If used) Amazon Web Services' S3 storage could have been used to store product images and other media content linked to product listings.

6. Equipment:

- Laptop/Desktops: Development was carried out on computers with specifications suitable for programming, web development, and running server-side applications.
- Web Browser: Google Chrome, Mozilla Firefox, or other browsers were used for testing the frontend interface and ensuring compatibility across devices.

Chapter 4: Implementation

The implementation of OBARLY involved a step-by-step approach, from planning and designing the architecture to developing and deploying the website. The project primarily aimed at creating an intuitive, scalable, and secure B2B platform for the hospitality industry. Here's a detailed breakdown of the implementation process:

1. Detailed Explanation of How the Project Was Implemented

Step 1: Requirement Analysis and Design Planning

The first step in the implementation was to understand the business requirements and design the platform accordingly. The OBARLY platform needed to facilitate seamless product browsing, dynamic pricing, inventory management, and efficient ordering.

- **Business Logic Mapping**: We broke down the project into several key functionalities:
- **Product Listings**: Businesses should be able to browse products, view dynamic pricing, add to cart, and proceed to checkout.
- **Inventory Management**: Admins and businesses should track inventory in real-time.
- **Order Management**: The system should manage orders and allow businesses to review, place, and cancel orders.
- **Shipping and Payment Integration**: Integration with payment gateways and providing real-time shipping costs.

Step 2: Frontend Development

- **UI/UX Design**: We focused on creating a clean and responsive design using **Tailwind CSS**. The homepage, product pages,

cart, checkout, and admin dashboard were developed using HTML, CSS, and JavaScript for interactivity.

- **Responsive Design**: Ensuring the website was mobile-friendly was a key focus. We used Tailwind CSS utilities to ensure elements adjusted seamlessly to different screen sizes.
- **Pages Developed**:
- **Home Page**: Displayed featured products, categories, and easy navigation for businesses to browse items.
- **Product Page**: Showed detailed information about each product including descriptions, images, and prices.
- **Cart and Wishlist**: Functionality was implemented for businesses to add products to their cart or wishlist and proceed to checkout.
- **Admin Dashboard**: Allowed admins to manage products, view sales, and track inventory.

Step 3: Backend Development

- **Flask Framework**: We used Flask, a lightweight Python framework, to handle the backend.
- **API Endpoints**: We created RESTful API routes to handle user authentication, product management, order management, and other key operations. Routes like /products, /cart, and /checkout were created to interact with the frontend.
- **Database Integration**: We used **MongoDB** to store product data, user information, and order details. MongoDB's flexibility allowed us to handle dynamic data like inventory levels, product variations, and user-generated content.

- **Product Management**: Admins could add, update, or delete products from the catalog through API endpoints like /add_product, /update_product, and /delete_product. Each product included details such as price, discount, categories, stock levels, and more.

Step 4: Database Setup and Management

- **MongoDB**: MongoDB was selected for its flexibility and scalability. Data such as products, orders, and user information was stored in a NoSQL database structure, which allowed for easy scaling and modification.
- **Collections Used**: We created collections like products, orders, users, and inventory. Each collection was designed to store specific data types related to OBARLY's operations.

Step 5: Testing and Debugging

- **Unit Testing**: Each API endpoint was tested using tools like **Postman** to ensure they were returning the correct data. We performed testing on the product management, order processing, and checkout APIs.
- **User Acceptance Testing**: After the backend was set up, we tested the platform with a sample of users to ensure the frontend displayed the correct data and that the overall user flow was intuitive.

2. Description of Algorithms, Code Snippets, or Design Diagrams

Algorithm for Product Addition

The process of adding a product to the platform involves creating a new document in the MongoDB database for each product. Below is a simplified version of the algorithm:

1. **Input Product Data**: The admin inputs product details through the Admin Dashboard.
2. **Validate Data**: Ensure that all necessary fields (name, price, categories, etc.) are filled.
3. **Store in Database**: The product details are stored in the products collection in MongoDB.
4. **Confirm Success**: A confirmation message is returned to the admin.

Code Snippet for Adding a Product (using Flask and MongoDB):

```
from flask import Flask, request, jsonify
from pymongo import MongoClient

app = Flask(__name__)

client = MongoClient('mongodb://localhost:27017/')
db = client['obarly']
products_collection = db['products']

@app.route('/add_product', methods=['POST'])
def add_product():
    data = request.json
    product = {
        'product_name': data['product_name'],
        'product_sku': data['product_sku'],
        'default_price': data['default_price'],
        'categories': data['categories'],
        'description': data['description'],
        'image_path': data['image_path'],
        'stock_value': data['stock_value']
    }

    result = products_collection.insert_one(product)
    return jsonify({"message": "Product added successfully", "product_id": str(result.inserted_id

if __name__ == "__main__":
    app.run(debug=True)
```

Algorithm for Checkout Process:

1. **Retrieve Cart Items**: Get the products that the user has added to the cart.
2. **Calculate Total**: For each item, calculate the total price, including discounts and shipping.
3. **Payment Integration**: Once the total is calculated, the system proceeds to payment integration (e.g., PayPal, Stripe).
4. **Update Inventory**: Reduce the inventory for the products bought.
5. **Confirm Order**: The order status is updated, and a confirmation is sent to the user.

3. Discussion of Challenges Faced During Implementation and Their Solutions

Challenge 1: Handling Dynamic Pricing and Discounts

- **Problem**: The platform needed to dynamically calculate discounts based on different criteria (e.g., seasonal discounts, promotional offers). Managing this complexity in the database and during the checkout process was challenging.
- **Solution**: We created a flexible system where each product could have multiple discount types (percentage, flat rate, etc.). The backend logic was designed to calculate the applicable discount based on the current offer and the product's attributes.

Challenge 2: Inventory Management and Real-Time Updates

- **Problem**: Ensuring real-time inventory updates when users place orders was a significant challenge, especially when multiple users were placing orders simultaneously.

- **Solution**: We implemented a locking mechanism on inventory updates. Whenever an order was placed, it temporarily locked the inventory for that product while updating the stock. This ensured no conflicts in stock data.

Challenge 3: Ensuring Seamless Integration Between Frontend and Backend

- **Problem**: Integrating the frontend (built with Tailwind CSS and JavaScript) with the backend (Flask and MongoDB) without causing delays in fetching and displaying data.
- **Solution**: We utilized **AJAX** calls from the frontend to asynchronously fetch data from the backend without reloading the page. This created a smooth and responsive user experience.

Challenge 4: Scalability and Performance

- **Problem**: As the number of users and products increased, ensuring the website's performance remained optimal was a concern, especially with real-time inventory updates.
- **Solution**: We optimized database queries, added pagination to product listings, and employed caching mechanisms to speed up repeated queries.

Chapter 5: RESULTS AND DISCUSSIONS

Results and Discussions

The **OBARLY Platform** was designed to be a robust, user-friendly e-commerce platform aimed at the hospitality industry, allowing businesses like restaurants, bars, and cloud kitchens to purchase products at wholesale prices. After implementation, we conducted various tests to ensure the platform was functional, scalable, and met the business requirements. Below are the results, followed by a detailed discussion of the key findings and learnings from the project:

1. Results

1.1. System Performance

- **Frontend**: The website performed smoothly across all devices, providing a responsive and engaging experience. Features such as product browsing, cart management, and checkout were intuitive and easy to navigate.
    - **Mobile Responsiveness**: The use of Tailwind CSS ensured that the platform was optimized for both desktop and mobile devices, which resulted in a positive user experience across devices.
    - **User Interface**: A user-friendly design allowed businesses to easily browse, search for, and purchase products. The inclusion of real-time stock updates and pricing made the shopping experience seamless.
- **Backend**: The backend, developed using Flask and MongoDB, handled requests efficiently. The API endpoints for managing products, processing orders, and updating inventories were responsive even under high traffic.

- **Database Efficiency**: The use of MongoDB allowed for rapid scaling of the platform as the data grew, and its NoSQL nature made handling dynamic product listings and user-generated content easy.
- **Order Processing**: The system successfully processed orders, updated inventories, and managed payments with minimal delay.

- **Inventory Management**: The real-time inventory system was successfully implemented, and inventory updates were automatically reflected in the catalog. Products with low stock were flagged, helping businesses manage stock levels effectively.
  - **Real-Time Inventory Updates**: When an order was placed, the inventory was updated instantly, and the product availability was checked again before confirming the order, preventing out-of-stock situations.

1.2. Key Features Implemented

- **Dynamic Pricing**: The platform successfully handled dynamic pricing models, including discounts, seasonal offers, and price adjustments based on the product's category.
  - For instance, when a business placed an order, the system would display the discounted price and the corresponding savings, allowing businesses to take advantage of promotions.
- **Order Management**: Businesses could place orders, track their status, and cancel orders when necessary. An integrated system was set up for businesses to manage their cart and wish list.

    - **Order Tracking**: Businesses could view the status of their orders in real-time and were notified when the order was shipped, providing full transparency in the process.
- **Shipping Integration**: The system incorporated shipping fee calculations, with businesses able to choose between fixed shipping costs or free shipping options, depending on their location or order quantity.
    - Shipping costs were calculated dynamically during checkout, ensuring businesses had a clear view of additional charges.
- **Admin Dashboard**: The admin dashboard allowed for easy management of products, orders, and users. Admins could update product details, manage categories, track sales, and monitor inventory levels.
    - The dashboard was designed to be simple yet powerful, enabling efficient operation of the platform.

1.3. Data Validation and Accuracy

- **Product Information**: During testing, we ensured that product information, including descriptions, prices, categories, and images, were displayed correctly. The system validated the data inputted by admins and flagged any missing or incorrect information.
- **Order Data**: Order data was accurately stored, and businesses could track orders from placement to shipment without errors.
- **Discount Calculations**: Discounts were correctly applied based on predefined conditions, ensuring the business owners received the correct pricing.

2. Discussions

2.1. Business Impact

The **OBARLY Platform** has the potential to significantly impact the businesses it was designed for, especially in the hospitality sector. By automating the order process and streamlining inventory management, OBARLY enables businesses to:

- **Save Time**: The platform automates ordering and inventory tracking, freeing up time for businesses to focus on operations.
- **Improve Efficiency**: With features like dynamic pricing and real-time inventory updates, businesses can ensure they are always stocked up on the most in-demand products without manual tracking.
- **Enhance Customer Experience**: The responsive design, fast checkout process, and real-time updates on order status provide businesses with a seamless shopping experience, leading to higher customer satisfaction.

2.2. Challenges Faced and Their Solutions

While the implementation was successful, there were a few challenges along the way, which provided valuable learning experiences.

- **Inventory Management Issues**: Initially, there were challenges in handling real-time inventory updates across multiple users. If two businesses ordered the same product at the same time, there were occasional stock discrepancies.
    - **Solution**: To overcome this, we introduced an inventory lock system. When an order was placed, the inventory for that product would be temporarily locked while the order

was processed. Once the order was completed or canceled, the lock was lifted, ensuring no conflicts occurred.

- **Shipping Fee Calculation**: Determining the correct shipping fee based on location, weight, and delivery method proved complex initially. The fees varied by product and delivery address, which needed constant recalibration.
    - **Solution**: We used an external API to calculate shipping costs dynamically based on the delivery address and item weight, which reduced errors and provided a more accurate estimate for the users.

2.3. Scalability and Future Enhancements

The **OBARLY Platform** was built with scalability in mind. However, as the platform grows, there are several areas that could benefit from further development:

- **Advanced Analytics and Reporting**: Adding features that allow businesses to generate sales reports, track purchasing patterns, and analyze customer behavior would be valuable. These features could be integrated into the admin dashboard.
- **AI-Based Product Recommendations**: By implementing machine learning algorithms, the platform could suggest products based on the business's past orders, preferences, and current trends, thus enhancing user experience and sales.

2.4. Potential for Wider Adoption

While the platform is currently focused on businesses in the hospitality sector, it has the potential to be adapted for other industries, including retail, manufacturing, and wholesale trade. Future adaptations could include:

- Expanding the product categories.
- Adding more detailed user roles (e.g., different levels of access for suppliers, managers, etc.).
- Integrating with larger enterprise systems like ERP and CRM for a more holistic business solution.

Chapter 6: FUTURE WORK

As the **OBARLY Platform** continues to grow and evolve, there are several areas where future enhancements and developments can be made to improve user experience, increase platform scalability, and expand functionality. Below are some key directions for future work:

1. Enhanced Data Analytics and Reporting

In the next phase of development, integrating advanced analytics features would help businesses gain deeper insights into their sales, customer behavior, and purchasing trends. Some potential features include:

- **Sales Analytics**: Dashboards to monitor and visualize sales performance over time, categorized by product, customer, or region.
- **Customer Insights**: Tools that analyze customer buying behavior to suggest personalized promotions and discounts.
- **Inventory Optimization**: Implementing predictive analytics to forecast demand, allowing businesses to optimize their stock levels and reduce overstocking or stockouts.

2. AI-Powered Product Recommendations

To enhance the shopping experience, we could introduce machine learning models that offer personalized product recommendations based on previous orders and customer preferences. This could include:

- **Product Similarity**: Recommending similar or complementary products that customers might be interested in based on their browsing and purchasing history.
- **Dynamic Promotions**: Offering personalized discounts or deals based on the customer's order history or preferences, improving the likelihood of repeat purchases.

3. Multi-Currency and Multi-Language Support

As **OBARLY** expands its reach to international markets, adding multi-currency and multi-language support will be essential to cater to a diverse customer base. This would include:

- **Currency Conversion**: Automatically converting prices to the local currency based on the user's location or preference.
- **Language Options**: Enabling users to choose their preferred language, making the platform more accessible for businesses in non-English speaking regions.

4. Integration with Third-Party Tools and Systems

As businesses scale, they often use various third-party tools for inventory management, financial tracking, and customer relationship management (CRM). Future work could include:

- **ERP System Integration**: Linking **OBARLY** with existing enterprise resource planning (ERP) systems to allow seamless data flow between the platform and businesses' internal tools.
- **CRM Integration**: Adding the ability to sync customer data with external CRM systems, enabling businesses to better manage customer relationships and marketing efforts.

5. Mobile Application Development

To further enhance accessibility, developing a mobile application for both iOS and Android platforms could provide businesses with the ability to manage their orders and inventory on the go. Key features could include:

- **Push Notifications**: Real-time updates on order status, stock levels, and promotions.
- **Order Management**: A streamlined mobile interface for businesses to view and manage their orders, track shipments, and make purchases from anywhere.

6. Advanced Payment Solutions

While the platform currently supports basic payment options, future work could include the integration of additional payment gateways and solutions to provide more flexibility:

- **Digital Wallets**: Integrating digital wallets like PayPal, Google Pay, and Apple Pay to facilitate easier and faster payments.

- **Subscription Models**: Adding the option for subscription-based purchasing for businesses that order products on a recurring basis, providing them with automatic billing and delivery.

7. Security and Data Privacy Enhancements

As the platform grows, security and data privacy will become even more critical. Future work should focus on:

- **Enhanced Encryption**: Ensuring that all sensitive business and customer data is securely encrypted and compliant with privacy regulations such as GDPR.
- **Two-Factor Authentication**: Implementing additional layers of security for admin and user accounts to protect against unauthorized access.

8. Expanding Product Categories and Supplier Network

To provide a more comprehensive solution for businesses, we could expand the platform's product offerings and supplier network:

- **More Product Categories**: Adding new product categories based on customer demand, including office supplies, kitchen equipment, and cleaning products.
- **Supplier Onboarding**: Building a more robust system for onboarding new suppliers, allowing businesses to access a wider range of products and suppliers.

9. User Feedback and Continuous Improvement

The future of **OBARLY** will rely heavily on ongoing user feedback and continuous improvement. Collecting and analyzing feedback from users will help identify pain points and areas for further development:

- **User Feedback Loop**: Implementing a feedback system where businesses can rate and review their experiences, providing valuable insights into platform improvements.
- **A/B Testing**: Continuously testing new features and design changes to ensure that updates meet user needs and enhance platform usability.

10. Sustainability Features

With increasing focus on sustainability, future versions of **OBARLY** could introduce eco-friendly features such as:

- **Carbon Footprint Tracking**: Providing businesses with the option to track the carbon footprint of their orders and suggesting eco-friendly alternatives.
- **Green Certifications**: Partnering with suppliers that offer certified sustainable products, allowing businesses to make more environmentally conscious purchasing decisions.

Conclusion

The future of the **OBARLY Platform** holds great potential for expanding features, improving usability, and scaling the platform to meet the needs of businesses across the globe. With continuous enhancements and the integration of new technologies, the platform can become a go-to solution for businesses in various sectors, offering them a seamless, efficient, and personalized experience. The focus will be on improving business efficiency, providing valuable insights, and fostering growth through innovative features and robust infrastructure.

Would you like to discuss any of these areas in more detail or explore specific future features?

CONCLUSION

In recent decades, there have been a vast number of reasons contributing to the unexpectedly growing crimes. Urbanization, rapid economic liberalization, growing large-scale political turmoil, fierce conflicts, and inadequate and inappropriate policies can be listed as the basis of crime in urban areas. Moreover, crime rate has significantly increased due to current pandemic, and has made things worse for the security officials of all countries.

The closed-circuit television (CCTV) is one of the devices used to monitor the secured area for any intruders. But the traditional CCTVs have their own set of flaws, which make them less effective for securing the area. This project tries to implement Machine Learning algorithms to enhance the working of traditional CCTVs, by adding functionalities:

1. **Monitor** – monitors the area under surveillance.
2. **Identify** – Identifies the family members.
3. **Noise Detection**– Finds any motion in the frame.
4. **In Out Detection** – Finds who enters and exits.

This will help make a stronger system for security concerns, and will make the users feel more secure when they are not at home. It will not only mitigate the risks of crime occurrence, but also capture anything and everything that can be considered as a proof against the criminal , provided the crime takes place.

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