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BRUUS: Unified POS and Inventory Platform with Automated Alerts

SOFTWARE ENGINEERING 1 (CSC 106)

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INTRODUCTION

Brief overview of the project

The Integrated Coffee Shop POS and Inventory Management System is a modern solution designed to streamline operations by unifying sales processing and real-time inventory tracking. It directly addresses critical inefficiencies in existing systems, such as weak security, manual inventory updates, disorganized interfaces, and lack of actionable insights.

INTRODUCTION

Problem statement

- The current Coffee Shop POS system suffers from critical inefficiencies:
- Weak security with no role-based access, allowing unauthorized personnel to view sensitive data.
- Manual inventory tracking, leading to errors and delays in restocking.
- No low-stock alerts, risking ingredient shortages.
- Unorganized UI (e.g., randomized size buttons) causing operational delays.
- Inability to track daily/weekly sales by product or identify non-selling items.
- System instability (crashes, lagging), disrupting order processing.

INTRODUCTION

Objectives of the project

- ·Implement role-based access control to secure sensitive data.
- ·Automate real-time inventory updates and low-stock alerts
- ·Provide sales analytics (daily/weekly reports by product) and highlight non-selling items.
- ·Design a stable, user-friendly POS interface with fixed layouts and minimal lag.

Project Background

DESCRIPTION OF THE PROJECT DOMAIN

The coffee shop industry relies heavily on efficient POS systems to manage high transaction volumes and dynamic inventory needs. However, many small businesses use outdated or manual systems, leading to operational bottlenecks, financial inaccuracies, and customer dissatisfaction. This project targets coffee shop owners seeking modern, integrated solutions to streamline sales and inventory management.

Project Background

CURRENT SYSTEM OR PROCESS

The existing system:

- Lacks role-based security, exposing financial data to all staff.
- Requires manual inventory input, increasing human error.
- Provides no low-stock notifications or sales breakdowns by product.
- Uses a disorganized UI with randomized buttons, slowing down order processing.
- Suffers from frequent crashes and lag, disrupting workflow.

Project Background

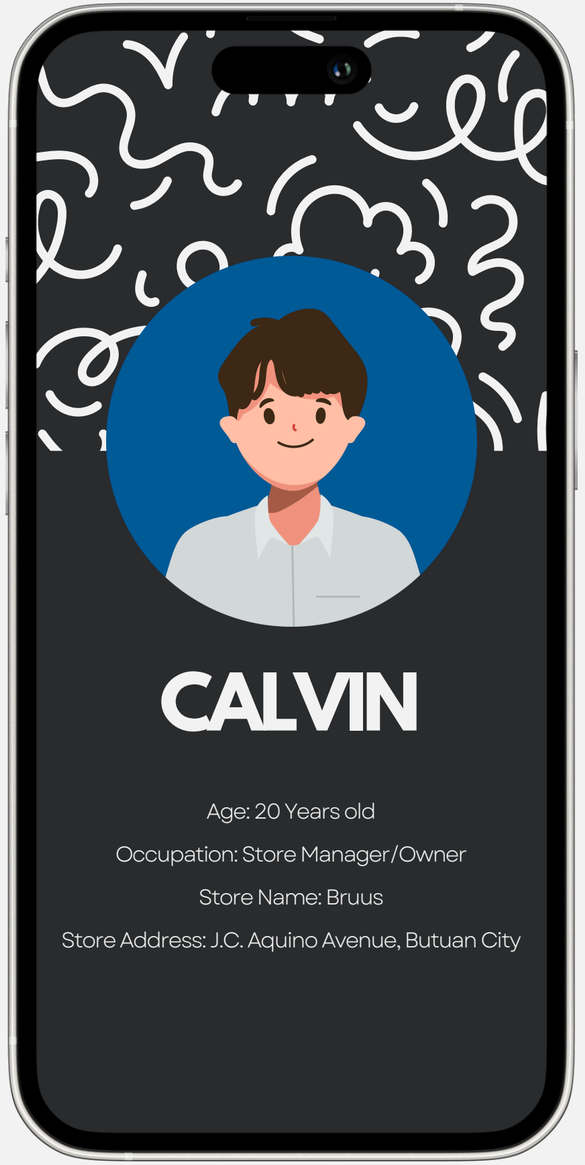
Why is this project necessary?

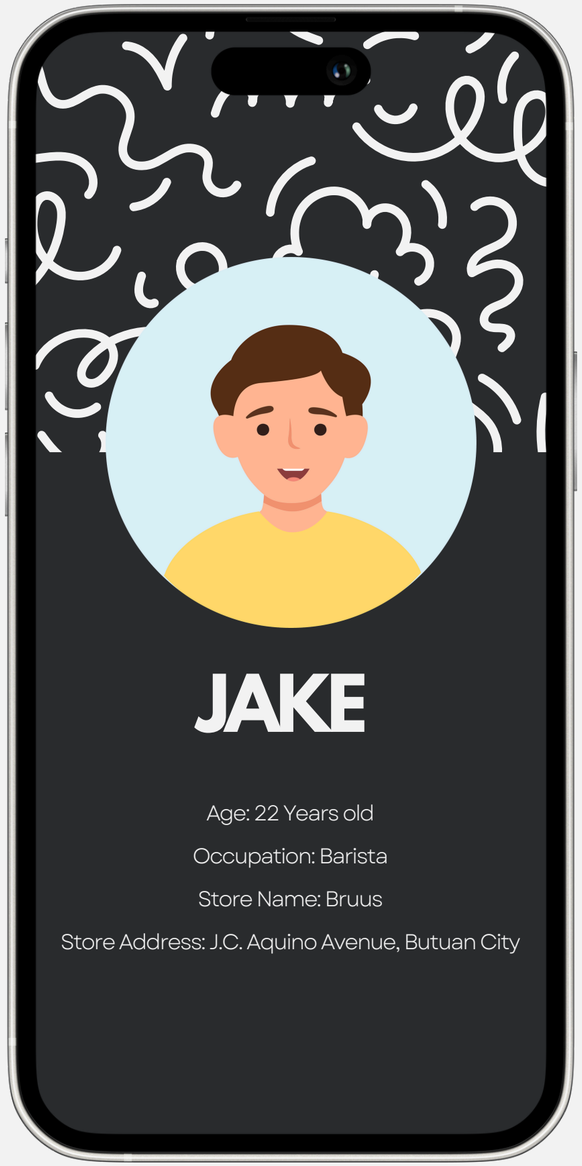
The new system addresses these gaps by:

- Enhancing security through role-based access (owner, barista, manager).
- Automating inventory updates and alerts, reducing manual work and errors.
- Providing actionable insights via sales analytics to optimize menu offerings.
- Improving system reliability with cloud-based architecture and crash recovery.
- Streamlining operations with an intuitive UI, fixed layouts, and offline support.
- This solution will save time, reduce costs, and improve decision-making for coffee shop owners.

User Persona

- [ ] Goals: Secure system access, real-time inventory tracking, sales analytics, and automated alerts.
- [ ] Behaviors: Monitors sales, manages staff permissions, reviews reports.
- [ ] Pain Points: Weak security, manual inventory input, inability to track low stock or non-selling products.





User Persona

Goals: Efficient order processing, organized menu interface, reliable system.

Behaviors: Processes orders, updates inventory after sales, interacts with POS daily.

Pain Points: System crashes, lagging interface, randomized UI buttons, manual inventory updates.

Stakeholder	Interest in the Project
Coffee Shop Owner	Secure system, automated inventory, sales insights.
Baristas	Stable POS, intuitive interface, reduced manual work.
Suppliers (Indirect)	Timely inventory restocking alerts.
Customers	Faster service, accurate orders.

“As an owner, I want role-based access control so that only authorized staff can view financial data.”

“As an owner, I want automated low-stock alerts so that I can reorder ingredients proactively.”

“As a barista, I want a stable POS system so that orders are processed without delays or crashes.”

“As a barista, I want a fixed menu layout so that size buttons are organized and easy to locate.”

USER STORIES AND REQUIREMENTS ANALYSIS

IDENTIFICATION OF USER REQUIREMENTS

a) FUNCTIONAL

- Role-based authentication (e.g., owner, barista).
- Image upload for products (e.g., coffee types).
- Real-time inventory updates after each sale.
- Automated low-stock notifications
- Sales tracking by product, size, and time (daily/weekly).
- Fixed UI layout for product customization (e.g., size buttons).
- Report generation for non-selling products.

b)NON-FUNCTIONAL

- Performance: Handle 50+ concurrent transactions without lag.
- Security: Enbcrypted user data and HTTPS for all communications.
- Usability: Intuitive interface with <2 clicks for common tasks.

Reliability: 99.9% uptime with crash recovery features.

POSSIBLE SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

• POS terminals/tablets with touchscreens.

•Central server for data storage.

SOFTWARE REQUIREMENTS

•Frontend: React.js (responsive UI).

•Backend: Node.js + Express.js.

•Database: MySQL with tables for Users, Products, Sales, Inventory.

•Cloud storage for product images (e.g., AWS S3).

DATABASE REQUIREMENTS

•Users Table: UserID, Role, Password (hashed).

•Products Table: ProductID, Name, Price, ImageURL, SizeOptions.

•Sales Table: SaleID, ProductID, Quantity, Timestamp.

•Inventory Table: ItemID, CurrentStock, MinimumThreshold.

THANK YOU!