



**American International University-Bangladesh (AIUB)**  
**Department of Computer Science Faculty of Science & Technology (FST)**

**Shop Management System**

A Software Engineering Project Submitted  
By

Semester-->Fall_25-26		Section:P
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# 1.PROJECT PROPOSAL

## 1.1 Background to the Problem

In Bangladesh, many small and medium retail shops still rely heavily on manual processes for their daily operations. Administrators and employees commonly use traditional methods such as writing product stock in notebooks, maintaining sales records manually, checking product availability by verbal confirmation, and tracking employee performance without any digital support. In many cases, multiple separate tools are used for inventory, billing, and user accounts, which remain disconnected and inefficient. These outdated practices generate several operational challenges: High error rate: Manual stock updates and handwritten invoices often lead to incorrect sales entries, stock mismatches, or missing items. Slow sales processing: Employees spend unnecessary time finding product details and preparing invoices manually, which increases customer waiting time. Weak security: Sensitive data like passwords, sales records, and financial information often lack proper protection. Poor monitoring: Admins struggle to track daily sales, best-selling products, and employee contributions due to lack of real-time reports. Scalability issues: As shops grow, manual systems fail to handle larger inventories, increased invoices, and more complex data. To address these issues, a unified digital solution is required—one that centralizes product management, sales processing, invoicing, user authentication, and reporting. The proposed Shop Management System aims to eliminate manual errors, automate key tasks, improve security, and support long-term scalability for retail businesses. It provides a structured, efficient, and secure environment where both admins and employees can operate smoothly.

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## 1.2 Solution to the Problem and Process Model Selection

### 1.2.1 Project Scope and Features

The proposed Shop Management System covers all essential operations needed by both admins and employees:

1. **Authentication & Role Management:** Secure login with strong passwords. Automatic generation of unique user IDs. Role-based access for Admin and Employee. Protected profile and password management
2. **User Profile Management:** Admins can view and update employee data (contact info, salary, account status). Employees can update their own profile and password. Prevents unauthorized edits and ensures privacy
3. **Product Catalog & Inventory Management:** Add, edit, delete, and view product details (name, category, size, price, stock). Real-time stock tracking to prevent overselling. Organized catalog with search and filter options
4. **Sales & Invoice Management:** Product search by ID, name, gender, or size. Add items to invoice with quantity validation. Automatic calculation of totals. Auto-generated unique invoice IDs. Access to past sales records for employees
5. **Reporting & Analytics:** Daily, weekly, and monthly sales summaries. Identification of top-selling products. Low-stock notifications. Employee sales performance overview

6. **Notifications & System Feedback:** Clear error messages for invalid input. Success messages for updates and sales. Smooth transitions to avoid workflow interruptions
  7. **Security Features:** Strong password enforcement. Protection of business data and user credentials. Unique IDs for users, products, and invoices to prevent conflicts
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### 1.2.2 Process Model Selection

To build a system with structured development, continuous testing, and controlled updates, the Incremental (Iterative) Process Model is most suitable. The system contains several independent modules such as authentication, product catalog, sales management, and reporting. Each of these can be developed and delivered in separate increments. This model allows: Rapid delivery of working modules. Early testing and user feedback. Easier debugging and enhancement. Reduced risk since features are added step-by-step. Flexibility for future extensions such as barcode scanning or online sales integration. The incremental approach ensures that the system grows gradually, improves continuously, and adapts to real-world needs during development.

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