



**SOFTWARE CONSTRUCTION AND
DEVELOPMENT
ARTIFACT NO # 2**

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BS SE 5-2

1. Project Title

“Inventory Management and Billing System for Small Businesses”

EXPANDED USECASES:

UC-10 — User Authentication (Login / Logout)

Field	Content
Use Case No.	UC-10
Name	User Authentication (Login / Logout)
Primary Actor	Any system user (Owner, Manager, Cashier, Accountant, Maintenance)
Short Description	Authenticate users and create role-based sessions.
Precondition	User account exists / provisioned.
Post condition	User session established or terminated with correct RBAC.
Normal Flow	1. User opens system and enters credentials. 2. System validates credentials. 3. System creates session and applies role permissions.
Alternative Flows	A1: Invalid credentials → deny access, log attempt. A2: Forgotten password → secure reset flow.

UC-11 — Assign & Manage Roles (RBAC)

Field	Content
Use Case No.	UC-11
Name	Assign & Manage Roles
Primary Actor	Store Owner (primary) / Store Manager (delegated)
Short Description	Create roles, assign users, and manage permissions (least privilege).
Precondition	Admin authenticated with role-management rights (UC-10).
Post condition	Roles updated; audit logged; users notified.
Normal Flow	1. Admin opens user/role management. 2. Admin assigns/edits role(s) for a user. 3. System validates and saves; notifies user.
Alternative Flows	A1: High-privilege role → require Owner approval before applying.

UC-03 — Add New Product

Field	Content
Use Case No.	UC-03
Name	Add New Product
Primary Actor	Store Manager / Admin
Short Description	Create a product record with SKU, pricing, tax, stock, and supplier.
Precondition	Manager authenticated with create permission (UC-10, UC-11).
Post condition	Product persisted in catalog and available for search/sale.
Normal Flow	1. Manager opens Add Product form. 2. Manager provides SKU, name, price, tax, initial stock, and supplier. 3. System validates SKU uniqueness and required fields. 4. Manager saves; system updates catalog.
Alternative Flows	A1: Duplicate SKU → prompt to edit or auto-generate SKU.

UC-04 — Edit / Delete Product

Field	Content
Use Case No.	UC-04
Name	Edit / Delete Product
Primary Actor	Store Manager / Admin
Short Description	Modify product details or mark product inactive / delete.
Precondition	Manager authenticated with edit/delete rights.
Post condition	Product updated or soft-deleted; audit log saved.
Normal Flow	1. Manager locates product (UC-05). 2. Manager updates fields and saves (or requests delete). 3. System validates and writes change; log entry created.
Alternative Flows	A1: Active transactions exist → block hard delete and suggest soft-delete.

UC-05 — Search / Filter Products

Field	Content
Use Case No.	UC-05
Name	Search / Filter Products
Primary Actor	Cashier, Store Manager/Admin, Accountant
Short Description	Find products by SKU, name, barcode or filters; return price & stock.
Precondition	User authenticated; product index available.
Post condition	Product(s) listed and selectable.
Normal Flow	1. User enters query or scans barcode. 2. System returns matches with price & stock. 3. User selects: for sale → UC-01, for edit → UC-04.
Alternative Flows	A1: No match → suggest close matches or offer UC-03 (Add Product).

UC-06 — Manual Stock Adjustment

Field	Content
Use Case No.	UC-06
Name	Manual Stock Adjustment
Primary Actor	Store Manager / Admin
Secondary Actors	Store Owner (informed)
Short Description	Adjust inventory counts with mandatory reason and audit.
Precondition	Manager authenticated with adjustment rights.
Post condition	Stock updated; adjustment logged (before/after, reason, user).
Normal Flow	1. Manager selects product (UC-05). 2. Manager enters delta/new quantity + reason. 3. System validates and updates stock. 4. If new stock \leq threshold \rightarrow UC-07 (Low-stock Alert).
Alternative Flows	A1: Missing reason \rightarrow system rejects until reason provided.

UC-07 — Low-stock Alert

Field	Content
Use Case No.	UC-07
Name	Low-stock Alert
Primary Actor	System (automated) / Store Manager (receiver)
Short Description	Notify manager/owner when stock falls to or below reorder threshold.
Precondition	Reorder threshold configured for products.
Post condition	Alert delivered; suggested reorder quantity shown.
Normal Flow	1. System detects stock \leq threshold (after UC-01 or UC-06). 2. System sends dashboard/email/SMS alert. 3. Manager reviews and places order manually or triggers auto-reorder.
Alternative Flows	A1: Auto-reorder enabled \rightarrow system creates PO to supplier.

UC-09 — Backup & Restore

Field	Content
Use Case No.	UC-09
Name	Backup & Restore
Primary Actor	Store Owner / Store Manager / Maintenance Team
Short Description	Export backup and restore system state; maintain integrity.
Precondition	Backup destination configured; credentials available.
Post condition	Backup stored; restore returns system to selected point.
Normal Flow	Backup: 1. Authorized user triggers backup or schedule runs. 2. System exports DB/files, verifies integrity, logs result. Restore: 1. Authorized user selects restore point. 2. System validates and applies restore.
Alternative Flows	A1: Verification fails \rightarrow alert maintenance and retry/abort.

UC-13 — System Maintenance & Patch Apply

Field	Content
Use Case No.	UC-13
Name	System Maintenance & Patch Apply
Primary Actor	Maintenance Team
Secondary Actors	Store Owner, Users (notified)
Short Description	Apply updates/patches, run tests, rollback when needed.
Precondition	Maintenance window scheduled; backup available (UC-09).
Post condition	System updated and verified or rolled back if failure.
Normal Flow	1. Notify stakeholders; prepare staging. 2. Apply patch in staging; run tests. 3. Deploy to production; run sanity checks. 4. Notify stakeholders and document.
Alternative Flows	A1: Post-deploy failure → perform UC-09 restore and investigate.

UC-01 — Process Sale

Field	Content
Use Case No.	UC-01
Name	Process Sale
Primary Actor	Cashier / Sales Staff
Secondary Actors	Inventory subsystem, Payment gateway, Printer (UC-02)
Short Description	Sell items to customer; update inventory and record transaction.
Precondition	Cashier authenticated (UC-10); products exist (UC-03) and are searchable (UC-05).
Post condition	Transaction recorded; inventory decremented; sale available in reports.
Normal Flow	1. Cashier searches/scans product (UC-05). 2. System shows details; cashier confirms quantities. 3. System validates stock. 4. Cashier selects payment method and pays. 5. System finalizes transaction and decrements stock. 6. System triggers UC-02 Print Receipt. 7. If stock \leq threshold, UC-07 created. 8. Transaction appears in UC-08 reports.
Alternative Flows	A1: Insufficient stock → adjust qty or backorder. A2: Payment failure → retry/alternate. A3: DB error → queue for retry (notify maintenance UC-13).

UC-02 — Print Receipt

Field	Content
Use Case No.	UC-02
Name	Print Receipt
Primary Actor	System (invoked by UC-01)
Secondary Actors	Cashier, Printer
Short Description	Generate and print or deliver digital receipt for sale.
Precondition	Sale transaction completed and stored (UC-01).
Post condition	Receipt printed and digital copy stored.
Normal Flow	1. System formats receipt with transaction details. 2. System sends print job. 3. Receipt printed; digital copy stored...
Alternative Flows	A1: Printer offline → provide digital receipt / queue reprint.

UC-12 — Return Products

Field	Content
Use Case No.	UC-12
Name	Return Products
Primary Actor	Customer (initiator) / Cashier (processor)
Short Description	Process returns, issue refund/store credit and update inventory.
Precondition	Original transaction exists and within return policy (UC-01).
Post condition	Refund/credit issued; inventory & reports updated.
Normal Flow	1. Cashier locates original transaction (UC-05→UC-01). 2. Cashier selects items to return and verifies eligibility. 3. System computes refund and updates inventory. 4. System logs return and updates UC-08.
Alternative Flows	A1: Outside policy/damaged → escalate to Manager (UC-11 approval path).

UC-08 — View Reports

Field	Content
Use Case No.	UC-08
Name	View Reports
Primary Actor	Store Owner (primary), Accountant, Store Manager
Short Description	Generate sales/inventory/returns reports for selected periods.
Precondition	User with report permission authenticated; data present.
Post condition	Report displayed/exported (PDF/CSV) or scheduled.
Normal Flow	1. User selects report type and date range. 2. System queries and renders report. 3. User downloads or schedules recurring report.
Alternative Flows	A1: Heavy query → offer sync generation and notify on completion.