

# DEPARTMENT OF SOFTWARE ENGINEERING

Faculty of Computing & Information Technology (FCIT)  
University of the Punjab, Lahore – PAKISTAN



## FYDP-DSE D1

### Agile: Product Backlog & Definition of Done

#### Smart Shopping Cart

***Bachelors of Science in Software Engineering  
(2022-2026)***

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## 1. Product Vision

A smart shopping cart system for retail customers that eliminates long checkout queues, prevents overspending, and improves inventory handling. By combining real-time purchase tracking with AI-powered budget-friendly recommendations, it helps shoppers save money and time while enabling retailers to automate stock management and improve operational efficiency.

## 2. Defined Epics & Features

### Epic 1: Design Scan Interface (UI Only)

- **Feature:** Build a responsive scan interface layout with a scan button, product area, and alert section.
- **Feature:** Develop a reusable React component (ScannerInterface.jsx) with simulated scan functionality using sample products.
- **Feature:** Display and manage cart items with alerts and confirmation pop-ups for item removal and cart clearing.
- **Feature:** Ensure clean, consistent, and responsive code with testing and updated README documentation.

### Epic 2: Customer Interface

- **Feature:** View live catalogue of items
- **Feature:** Scan items using barcode/RFID
- **Feature:** Display product details (name, price, stock availability)
- **Feature:** Show real-time bill total and item count

### Epic 3: Total Calculation Module

- **Feature:** Automatic total price calculation
- **Feature:** Update totals when items are added/removed
- **Feature:** Budget limit indicator

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## **Epic 4: Inventory Management**

- **Feature:** Real-time stock updates with central database
- **Feature:** Low-stock threshold detection
- **Feature:** Inventory staff dashboard for restocking

## **Epic 5: Notification & Alerts Module**

- **Feature:** Automated alerts for inventory managers
- **Feature:** Supplier notifications for critical shortages
- **Feature:** Dashboard alerts for managers

## **Epic 6: AI Recommendation Module**

- **Feature:** Budget-friendly product suggestions
- **Feature:** Personalized recommendations based on cart items\*/

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## 3. Initial Product Backlog (Stories with Priority)

Priority	User Story
Must	As a customer, I want a scan interface UI so that I can view scanned products on screen.
Must	As a developer, I want to create a React component for the scan interface (UI only) so that it's modular, reusable, and easy to maintain.
Must	As a tester, I want to verify responsiveness and element alignment so that the interface looks correct and consistent on all screen sizes.
Must	As a team member, I want to commit the code, update the README, and mark the Jira tasks as done so that the work is properly documented and traceable.
Should	As a user, the scan interface should clearly show alert or message notifications (such as successful scans, item removals, or cart clearing).
Should	As a developer, the scan interface should follow proper naming conventions and clean code structure to remain maintainable.
Could	Implement a simulated scanning function to mimic adding items via barcode/RFID input (UI-level prototype).
Won't (for now)	Fetch product details from the database or API for each scanned item (to be implemented later during hardware integration).

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## 4. Definition of Done (DoD) Checklist

DoD is the team's agreement on what “done” means. All stories/features must meet this before being considered complete.

### Design Scan Interface

- React component for the scan interface is created (UI only, no hardware logic yet).
- Layout includes a scan button/icon, product display area, and message/alert section.
- Code follows clean structure and naming conventions.
- UI tested in browser for responsiveness and correct element alignment.
- Code pushed and committed to the Git repository.
- Peer/team review completed (if applicable).
- README updated with component purpose and usage instructions.
- Jira task marked as “Done.”

## 5. Git Repo & Branching Strategy

Our team **will use GitHub** for version control, collaborative development, and continuous integration/deployment (CI/CD) automation through **GitHub Actions**.

The following branching model will ensure structured development, high code quality, and efficient deployment management.

### Main Branch (main)

- It will contain only production-ready code.
- It will act as the protected branch, where direct commits will be prohibited.
- All updates will be made through Pull Requests (PRs) that will need to pass review and CI checks before merging.

### Develop Branch (develop)

- It will maintain the latest integrated version of all completed and tested features.
- It will serve as a staging environment before code is merged into the main branch.
- Every merge will trigger automated build validations and unit tests through GitHub Actions.

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## **Feature Branches (feature/<feature-name>)**

- These branches will be used to develop individual features independently.
- They will always be created from the develop branch.
- After development and testing, each feature branch will be merged back into develop through a reviewed Pull Request (PR).

## **Hotfix Branches (hotfix/<issue-name>)**

- These branches will be used for urgent production fixes.
- They will be created directly from the main branch.
- Once the fix is completed, the branch will be merged into both main and develop to maintain synchronization.

## **Branch Protection Rules**

- Direct commits to main and develop will not be allowed.
- All merges will occur through Pull Requests (PRs).
- Each PR will require at least one team member's review and approval.
- GitHub Actions will automatically run tests, lint checks, and builds before a merge is approved.
- Merge conflicts will need to be resolved locally before final submission.

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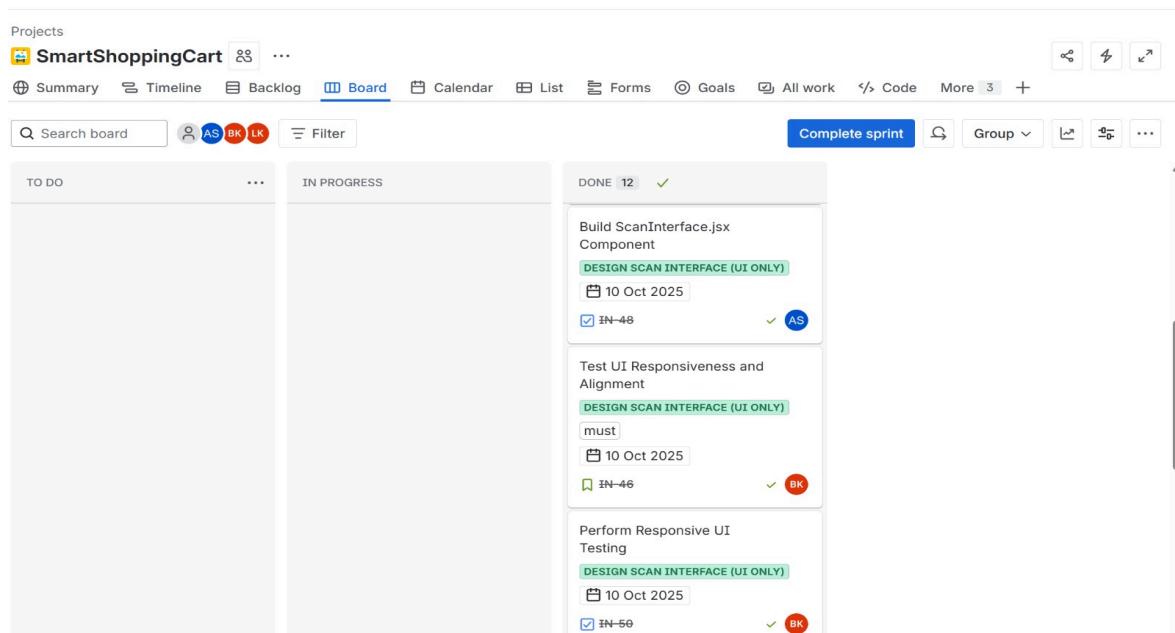


## **6. Jira Board Screenshot (if used)**

Below are the screenshots of our Jira Scrum Board for Epic: Design Scan Interface (UI Only). All user stories and tasks for this sprint are shown under the Done column, indicating completion of work as per the Definition of Done (DOD)

### **Jira Board Link:**

<https://pucit-team-wivu0h4p.atlassian.net/jira/software/projects/IN/boards/5>



TO DO	IN PROGRESS	DONE
		<p>Build ScanInterface.jsx Component <b>DESIGN SCAN INTERFACE (UI ONLY)</b> 10 Oct 2025 IN-48 AS</p> <p>Test UI Responsiveness and Alignment <b>DESIGN SCAN INTERFACE (UI ONLY)</b> must 10 Oct 2025 IN-46 BK</p> <p>Perform Responsive UI Testing <b>DESIGN SCAN INTERFACE (UI ONLY)</b> 10 Oct 2025 IN-50 BK</p>

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Projects

**SmartShoppingCart** 88 ...

Summary Timeline Backlog **Board** Calendar List Forms Goals All work ↗/ Code More 3 +

Search board Filter Complete sprint Group ▾

TO DO	IN PROGRESS	DONE
		12 ✓
		Build ScanInterface.jsx Component <b>DESIGN SCAN INTERFACE (UI ONLY)</b> due 10 Oct 2025 IN-48 ✓ AS
		Test UI Responsiveness and Alignment <b>DESIGN SCAN INTERFACE (UI ONLY)</b> must due 10 Oct 2025 IN-46 ✓ BK
		Perform Responsive UI Testing <b>DESIGN SCAN INTERFACE (UI ONLY)</b> due 10 Oct 2025 IN-50 ✓ BK

Projects

**SmartShoppingCart** 88 ...

Summary Timeline Backlog **Board** Calendar List Forms Goals All work ↗/ Code More 3 +

Search board Filter Complete sprint Group ▾

TO DO	IN PROGRESS	DONE
		12 ✓
		Commit, Document, and Complete Scan Interface <b>DESIGN SCAN INTERFACE (UI ONLY)</b> must due 10 Oct 2025 IN-47 ✓ LK
		Finalize and Document Component <b>DESIGN SCAN INTERFACE (UI ONLY)</b> due 10 Oct 2025 IN-51 ✓ LK
		Design Clear Alert and Message Section <b>DESIGN SCAN INTERFACE (UI ONLY)</b> Should due 8 Oct 2025 IN-52 ✓ AS

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The screenshot shows a Jira board for the project 'SmartShoppingCart'. The board has three columns: TO DO, IN PROGRESS, and DONE. The DONE column contains three tasks:

- Implement Message/Alert Display  
Design Scan Interface (UI ONLY)  
Due: 8 Oct 2025  
Status: IN-53 (AS)
- Maintain Code Structure and Naming Conventions  
Design Scan Interface (UI ONLY)  
Should  
Due: 10 Oct 2025  
Status: IN-54 (BK)
- Review and Refactor Code for Consistency  
Design Scan Interface (UI ONLY)  
Due: 10 Oct 2025  
Status: IN-55 (BK)

## 7. Planned GitHub Action Flow Pipeline

### Links

- The repository link is (<https://github.com/haiqakhan1/smartsShoppingCart>)
- The workflow link is (<https://github.com/haiqakhan1/smartsShoppingCart/tree/main/.github/workflows>)

### Workflow Triggers

The pipeline will run automatically on:

- Every push to develop or main.
- Every pull request targeting develop or main.

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## **Automated Steps**

1. Checkout the latest code from the repository.
2. Install dependencies:
  - npm ci → for frontend (React).
  - dotnet restore → for backend (ASP.NET Core).
3. Run ESLint for frontend code quality checks.
4. Execute automated tests:
  - Frontend: npm test (Jest).
  - Backend: dotnet test (xUnit).
5. Build both applications:
  - npm run build → frontend.
  - dotnet build and dotnet publish → backend.
6. Run security and vulnerability scans on all dependencies.
7. Deploy automatically to staging (on the develop branch) after successful checks.
8. Deploy to production (on the main branch) after all checks pass and deployment approval is granted.