EXECUTIVE SUMMARY

Project Vision

The Laptop Catalog Request Item project aims to create a streamlined, automated system that allows employees to request standardized laptop configurations through a centralized catalog. By automating workflows and integrating with asset management, the system enhances transparency, cost control, and user experience while supporting efficient onboarding and hardware lifecycle management.

Project Objectives

1. Standardize laptop configurations based on organizational roles and IT policies.
2. Automate the request and approval workflow to reduce manual processing.
3. Decrease overall request fulfilment time.
4. Improve visibility of laptop inventory and asset tracking.
5. Ensure compliance with IT governance and procurement guidelines.

Fig: Information about the laptop catalog request item

Core Features

- **Standardized Laptop Catalog** – Predefined, role-based laptop models to ensure IT compliance.
- **Automated Approval Workflow** – Multi-level approval routing to reduce manual processing.
- **Inventory & Asset Integration** – Real-time stock validation and automatic asset tagging.
- **Real-Time Status Notifications** – Automated alerts and self-service tracking for requests.
- **Reporting & Analytics Dashboard** – Centralized insights on requests, costs and trends.

- Duration between request submission and final approval.
- Percentage of requests selecting predefined configurations.
- Monitoring hardware expenses across teams.
- Feedback rating on request experience and delivery efficiency.

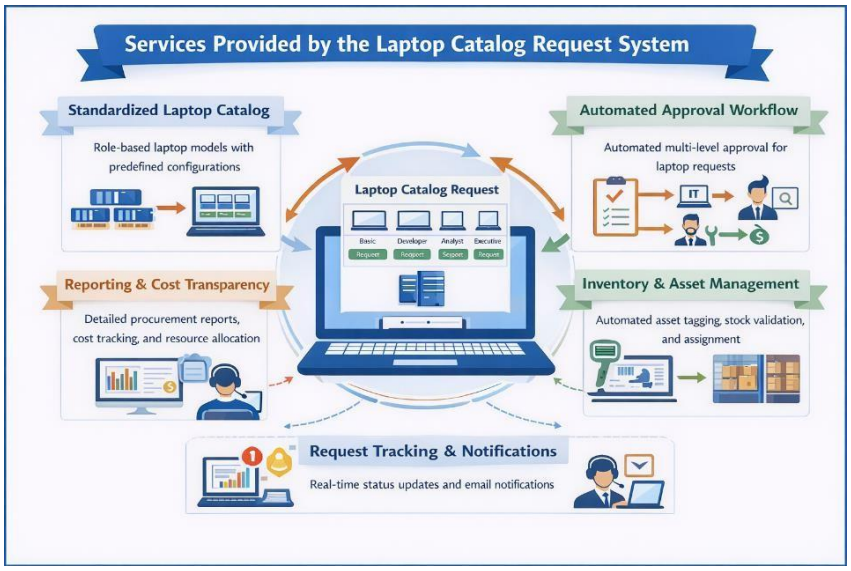

Fig: Services using laptop catalog request item

CHAPTER I: PROJECT INITIATION & PROBLEM ANALYSIS

1.1 Problem Statement Core

Challenge:

The current laptop request process is manual, inconsistent, and lacks standardization, leading to approval delays and policy non-compliance. Limited inventory visibility and uncontrolled procurement result in higher costs, errors, and inefficient resource allocation.

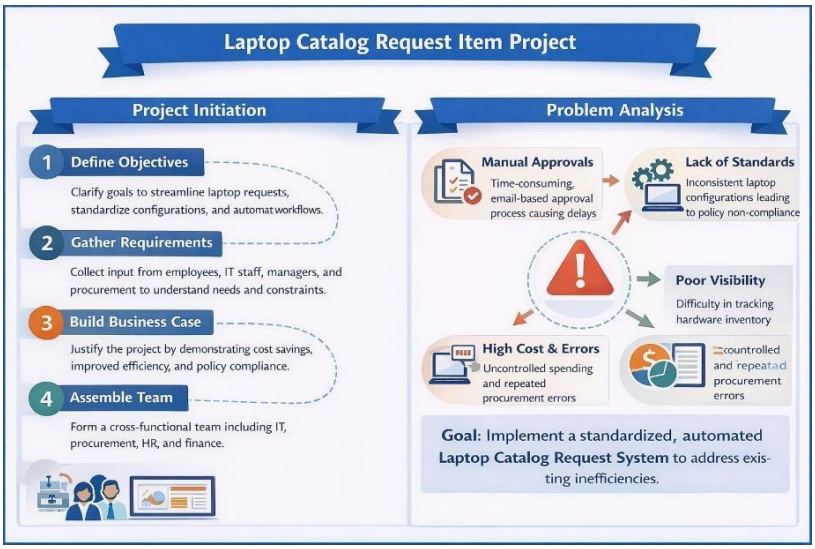

Fig: Introduction to PI and PA

1. **Specific Problems Identified:**

Problem	Impact	Current State
Manual Approval Process	Delays in request processing and reduced productivity	Multiple unconnected systems
Lack of Standardized Configurations	Policy non-compliance and inconsistent device allocation	Users request custom configurations without defined standards
Poor Inventory Visibility	Difficulty in tracking assets and stock shortages	No real-time inventory integration or centralized tracking
Uncontrolled Procurement	Increased hardware costs and duplicate purchases	Decentralized purchasing without spend monitoring
Limited Request Tracking	Low transparency and frequent follow-ups	No real-time status updates or self-service tracking system

1.2 Solution Description

Laptop Catalog Request Item is a structured service request within an organization's IT service that:

1. Provides predefined, role-based laptop models to ensure consistency and compliance.
2. Automates multi-level approvals to reduce delays and manual effort.
3. Enables real-time inventory validation and asset tracking.
4. Generates reports to monitor hardware spending and budget usage.
5. Allows employees to submit and track requests through a centralized portal.
6. Sends automated notifications to keep stakeholders informed throughout the process.

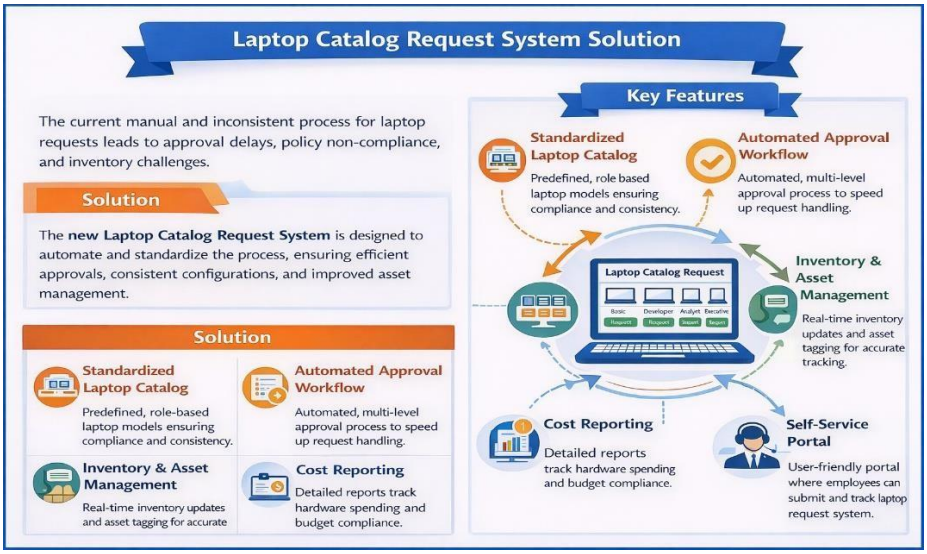

Fig: Automated Laptop Request Solution Architecture

1.3 Problem-Solution Fit Analysis

This platform directly addresses each identified problem:

Problem	Solution Component	Expected Outcome
Manual and email-based laptop requests	Centralized self-service catalog portal	Faster request submission and reduced dependency on manual communication
Delayed approvals due to unclear routing	Automated multi-level approval work-flow	Reduced approval cycle time and improved accountability
Inconsistent laptop configurations	Predefined, role-based standardized models	Policy compliance and uniform device allocation
Lack of inventory visibility	Integration with inventory & asset management system	Real-time stock tracking and reduced procurement delays
Duplicate or unnecessary purchases	Controlled catalog selection with approval validation	Cost optimization and elimination of redundant purchases
No transparency in request	Real-time tracking dashboard with notifications	Improved user experience and fewer follow-up inquiries

CHAPTER II: IDEATION & BRAINSTORMING

2.1 Ideation Session Outcomes

The platform evolved through collaborative request sessions focusing on:

1. **Centralized Request Platform** – Agreement to develop a self-service laptop request portal to replace manual and email-based processes.

2. **Standardized Configurations** – Decision to introduce predefined, role-based laptop models to ensure consistency and IT policy compliance.

3. **Workflow Automation** – Proposal to implement automated multi-level approvals to reduce delays and improve accountability.

4. **Inventory Integration** – Recommendation to integrate with asset and inventory systems for real-time stock visibility and tracking.

5. **Reporting & Cost Transparency** – Identification of analytics and reporting features to monitor spending and support informed decision-making.

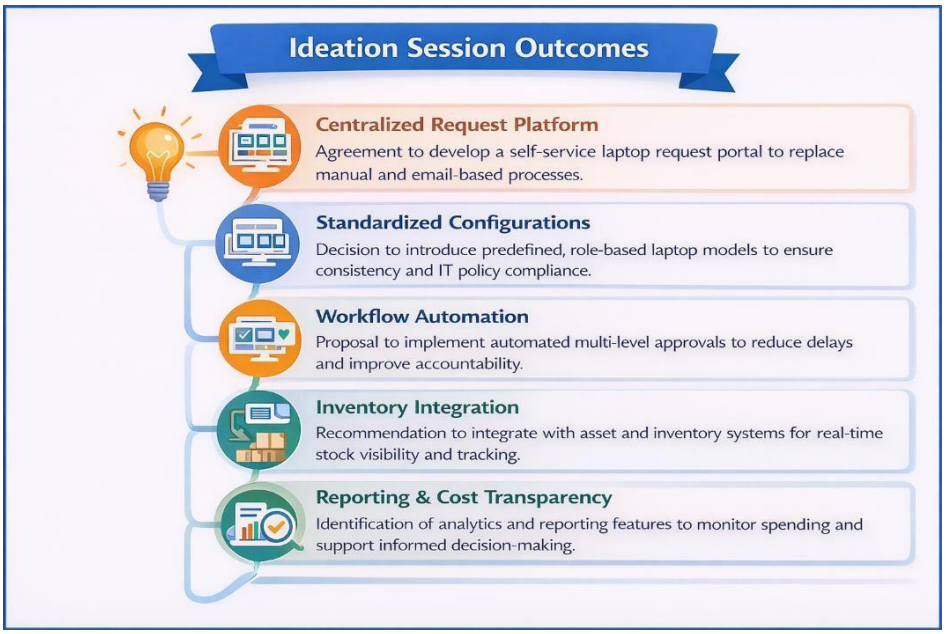

Fig: Ideation process of requests workflow

2.2 Requests Journey Mapping

Journey Stage 1: Request Submission: Employee selects a standardized laptop model, provides required details, and submits the request through the self-service portal**.**

Journey Stage 2: Approval & Processing: The system routes the request for automated multi-level approvals and IT validation.

Journey Stage 3: Fulfillment & Closure: The laptop is allocated or procured, asset-tagged, delivered to the employee, and the request is closed with notification.

2.3 Feature Prioritization Matrix

Feature	Priority	User Impact	Complexity
Standardized Laptop Catalog	High	High – Ensures consistency and easy selection	Low
Automated Approval Workflow	High	High – Reduces delays and improves accountability	Medium
Self-Service Request Portal	High	High – Improves user experience and accessibility	Medium
Inventory & Asset Integration	High	High – Enables real-time tracking and control	High
Real-Time Notifications	Medium	Medium – Improves transparency and reduces follow-ups	Low
Role-Based Access Control	Low	Low–Medium – Enhances security and governance	Medium

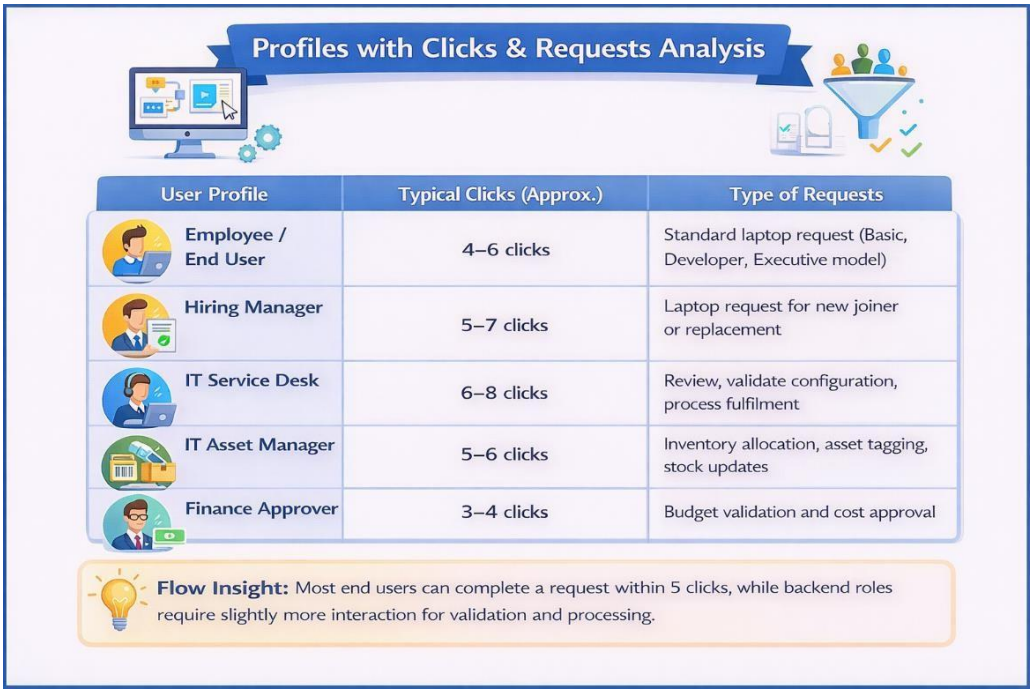

Fig: User Profiles with clicks and requests

CHAPTER III: REQUIREMENTS ANALYSIS

3.1 Functional Requirements

FR1: The system shall allow users to select predefined, role-based laptop models from a centralized catalog.

FR2: The system shall capture mandatory request details such as business justification, cost center, and employee role.

FR3: The system shall automatically route requests through multi-level approval workflows (Manager → IT → Finance).

FR4: The system shall validate inventory availability before proceeding with fulfillment.

FR5: The system shall enable IT to allocate, tag, and update asset records during fulfillment.

FR6: The system shall provide real-time status tracking and automated notifications to stakeholders.

FR7: The system shall generate reports for monitoring request trends, approval timelines, and cost analysis.

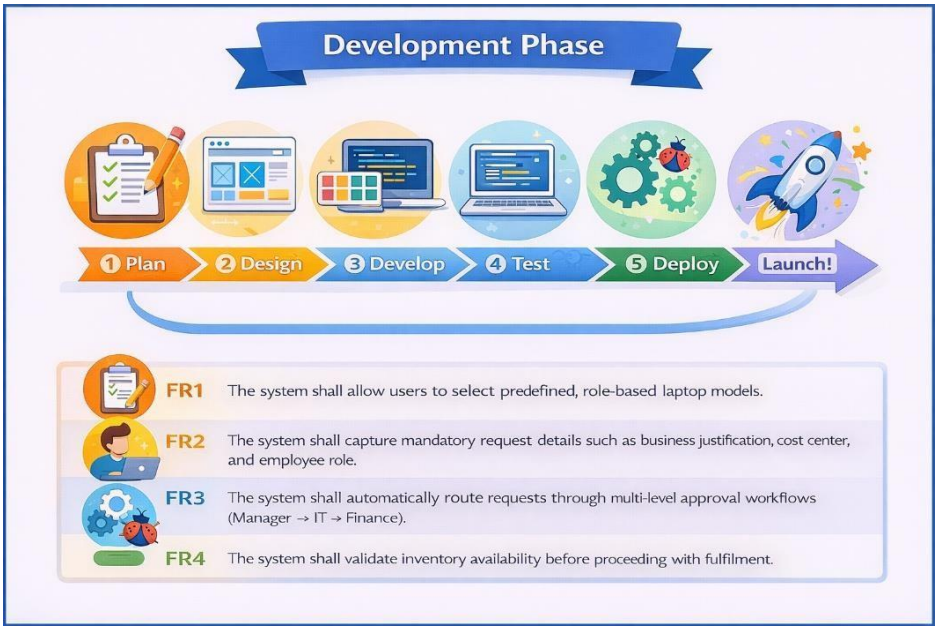

Fig: Development phase

2.4 Non-Functional Requirements

Requirement	Specification
Performance	The system shall support at least 500 concurrent users with page load time under 3 seconds.
Availability	The system shall maintain 99.5% uptime excluding scheduled maintenance.
Scalability	The system shall support horizontal scaling to handle increased request volumes without performance degradation.
Security	The system shall implement role-based access control (RBAC) and encrypt data in transit using HTTPS.
Reliability	The system shall ensure zero data loss with automated daily backups and recovery mechanisms.
Usability	The system shall provide an intuitive self-service interface with minimal training required.
Maintainability	The system shall follow modular architecture and documented APIs for easier updates and enhancements.

CHAPTER IV: PROJECT DESIGN & ARCHITECTURE

4.1 System Architecture Overview

The Citizen AI platform follows a **three-tier microservices architecture:**

Tier 1: Presentation Layer - Employee self-service portal for submitting and tracking laptop requests.

Tier 2: Application Layer - Handles workflow routing, validation, approvals, and notifications.

Tier 3: Data Layer - Stores catalog data, request records, approval logs, and inventory details.

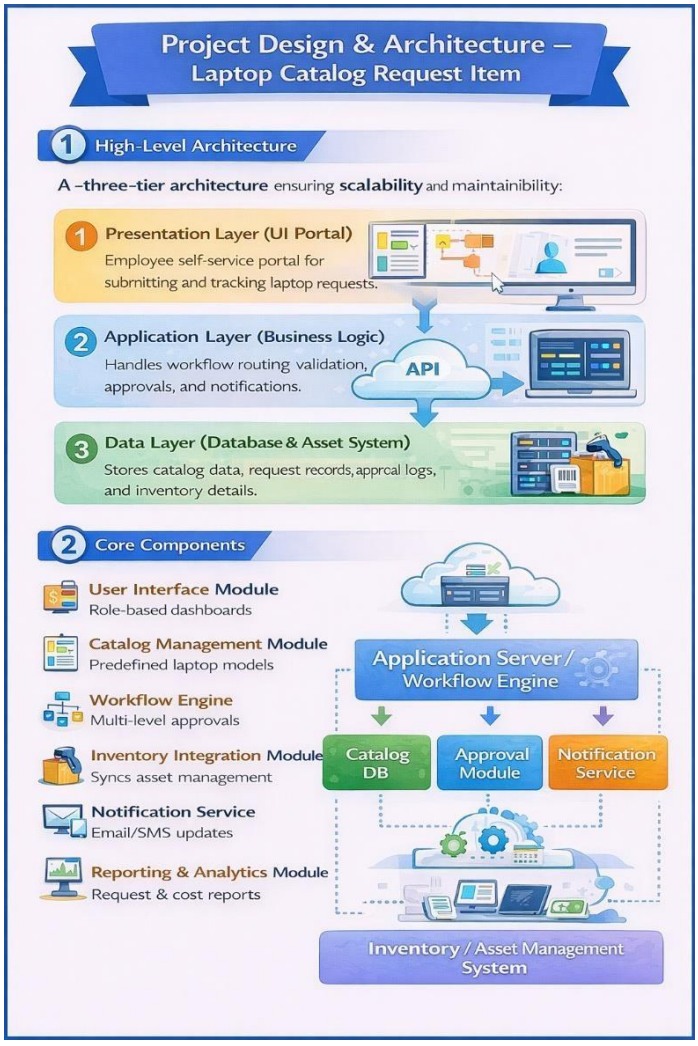

Fig: System architecture design

4.2 Technology Stack

Component	Technology	Rationale
Frontend (User Portal)	React.js / Angular	Provides responsive, dynamic UI with reusable components and fast performance.
Backend (Application Layer)	Node.js / Java Spring Boot	Supports scalable REST APIs and robust business logic implementation.
Database	MySQL / PostgreSQL	Ensures structured data storage with high reliability and ACID compliance.
Workflow Engine	Camunda / ServiceNow Workflow	Automates multi-level approval routing and process orchestration.
Authentication & Security	OAuth 2.0 / JWT	Enables secure role-based access control and token-based authentication.
Hosting / Deployment	AWS / Azure Cloud	Offers scalability, high availability, and flexible infrastructure management.
Reporting & Analytics	Power BI / Tableau	Provides real time dash-Boards and actionable in Sights for monitoring Performance.

4.3 Architecture Diagram - Microservices Components

1. **Frontend (User Portal Service)** – Provides user interface for submitting and tracking laptop requests.
2. **API Gateway** – Acts as a single-entry point, routing requests to appropriate microservices securely.
3. **Authentication Service** – Manages secure login, token validation, and role-based access control.
4. **Catalog Service** – Maintains laptop models, configurations, and availability details.
5. **Request & Workflow Service** – Processes requests and manages multi-level approval workflows.
6. **Notification & Reporting Service** – Sends status updates and generates analytics/reporting data.

CHAPTER V: PROJECT PLANNING & AGILE FRAMEWORK

5.1 Product Backlog

The project is structured using **Agile Scrum methodology** with the following backlog prioritization:

Epic 1: Define and configure standardized, role-based laptop catalog models.
Epic 2: Develop the self-service user portal for request submission and tracking.
Epic 3: Implement automated multi-level approval workflows with escalation rules.
Epic 4: Integrate inventory and asset management for real-time validation and allocation.
Epic 5: Ensure security, authentication, role-based access, and audit compliance.
Epic 6: Build reporting and analytics dashboards for monitoring requests and costs.

5.2 Sprint Planning Structure

Sprint Duration: 2 weeks **Sprint Velocity Target:** 40-50 story points **Ceremonies:** - Sprint Planning (4 hours) - Daily Standup (15 minutes) - Sprint Review (2 hours) - Sprint Retrospective (1.5 hours)

5.3 User Stories & Story Points

User Story Example 1: Issue Categorization

As an employee, I want to select a predefined laptop model so that I can request a device easily.

Story Points: 3

User Story Example 2: Real-time Status Tracking

As a manager, I want to approve or reject requests so that I can control department spending.

Story Points: 5

5.4 Release Planning

Release	Timeline	Focus	Status
v0.1 (MVP)	Months 1-2	Catalog setup, request submission, basic manager approval workflow	Planned
v0.2 (Chatbot)	Month 3	Multi-level approvals (IT & Finance), status tracking, notification	Planned
v1.0 (Production)	Month 4	Inventory & asset integration, security implementation (RBAC)	Planned
v1.1 (Analytics)	Month 5	Reporting & analytics dashboard, performance optimization	Planned

CHAPTER VI: DEVELOPMENT PHASES

6.1 Model Selection & Catalog Integration

Selected Models:

1. **Basic User Model –** Intel i5 / 8GB RAM / 256GB SSD – For administrative and general office tasks.
2. **Business Standard Model** – Intel i5/i7 / 16GB RAM / 512GB SSD – For analysts and business users.
3. **Developer Model –** Intel i7 / 16–32GB RAM / 1TB SSD – For development, testing roles

6.2 Backend Development - API Endpoints Structure

Authentication Endpoints: - POST /api/auth/login – User login and token generation, POST /api/auth/logout – Logout and token invalidation, GET /api/auth/profile – Fetch logged-in user details.

User & Role Management Endpoints: - GET /api/users – Retrieve user list, GET /api/users/{id} – Get user details, PUT /api/users/{id}/role – Update user role.

Catalog Management Endpoints: - GET /api/catalog/models – View all laptop models.

Catalog Request Endpoints:-POST /api/requests – Create new laptop request, GET /api/requests – View all requests, PUT /api/requests/{id} – Modify request.

6.2 Frontend Development - Responsive UI Components

1. Employee (Citizen) Dashboard - Allows users to submit new laptop requests, track request status, view request history, and receive notifications.

2. Admin Dashboard- Enables IT admins to manage laptop catalog models, configure workflows, monitor inventory levels, and generate reports.

3. Request Management Dashboard- Provides a consolidated view of all requests with approval stages, pending actions, SLA tracking, and performance metrics.

CHAPTER VII: PERFORMANCE TESTING & QUALITY ASSURANCE

7.1 Testing Strategy

Unit Testing - Tests individual components or modules (e.g., API endpoints, UI components) for correctness.

Integration Testing - Ensures that multiple modules (e.g., request submission + approval workflow + inventory) work together correctly.

Performance Testing -Checks system responsiveness, load handling, and stability under high user traffic.

Security Testing - Validates authentication, authorization, data encryption, and vulnerability management.

Fig: Testing Strategy for Development process

7.2 Key Performance Metrics

Metric	Target	Current
Total Laptop Requests	100 per month	78
Requests Processed On Time	95%	88%
Approval Rate	90%	85%
Average Processing Time (days)	≤ 3 days	4 days
Catalog Accuracy (correct specs)	100%	98%
Vendor Fulfilment Rate	100%	95%
User Satisfaction (requesters)	≥ 90%	87%

7.3 Quality Assurance Checklist

- **Request Validation** – Ensure all laptop requests have complete and accurate details (model, specs, quantity).

- **Approval Workflow Check** – Confirm requests follow the correct approval process without bypassing any step.

- **Catalog Accuracy** – Verify that all laptop specifications in the catalog are correct and up to date.

- **Processing Time Compliance** – Check that requests are processed within the defined SLA (e.g., ≤3 days).

- **Vendor Fulfilment Verification** – Confirm that supplied laptops match requested specifications and quantities.

- **User Feedback & Satisfaction** – Collect requester feedback to ensure the process meets user expectations.

CHAPTER VIII: DEPLOYMENT & MONITORING

8.1 Deployment Strategy

Deployment Environment: - Local/dev servers with version control, testing frameworks, and staging setup.

Deployment Stages: 1. Develop & Test → Staging/UAT → Production Release → Monitoring & Maintenance.

8.2 Monitoring & Observability

Key Monitoring Dashboards: - Use dashboards to track request volume, processing time, approval rates, system uptime; set alerts for SLA breaches, failed requests, or downtime exceeding thresholds.

Alerting Thresholds: - Request metrics, catalog accuracy, vendor fulfilment, and user satisfaction dashboards with thresholds like processing >3 days, fulfilment <95%, or system uptime <99.9%.

Feedback Mechanism

- **User Surveys:** Collect feedback from requesters on process ease and satisfaction.
- **In-App Feedback:** Provide a form or button in the dashboard for real-time comments.
- **Periodic Review Meetings:** Discuss feedback trends with stakeholders for improvements.
- **Issue Tracking & Resolution:** Log feedback as issues, track resolutions, and inform users of actions taken.

CHAPTER IX: ADVANTAGES, DISADVANTAGES & RISKS

9.1 Advantages

- **Streamlined Requests:** Centralized system simplifies laptop requests and approvals.
- **Improved Accuracy: Ensures correct specs and quantities through catalog validation.**
- **Faster Processing:** Reduces turnaround time with automated workflows.
- **Enhanced Tracking:** Provides visibility into request status and fulfillment.
- **Data-Driven Decisions:** Metrics and dashboards help optimize procurement and inventory planning.

Fig: Advantages of Catalog Request item

9.2 Disadvantages

- **Streamlined Requests:** Centralized system simplifies laptop requests and approvals.
- **Improved Accuracy: Ensures correct specs and quantities through catalog validation.**
- **Faster Processing:** Reduces turnaround time with automated workflows.
- **Enhanced Tracking:** Provides visibility into request status and fulfillment.
- **Data-Driven Decisions:** Metrics and dashboards help optimize procurement and inventory planning.

Fig: Disadvantages of laptop catalog request

9.3 Risk Assessment & Mitigation

Risk	Probability	Impact	Mitigation Strategy
Vendor delays	Medium	High	Maintain multiple approved vendors and buffer inventory.
System downtime	Low	High	Implement robust monitoring, alerts, and backup systems.
Incorrect catalog data	Medium	Medium	Regular audits and QA checks before approving requests.
Security breaches / data leaks	Low	High	Use encryption, access controls, and regular security audits.
User errors / misuse	Medium	Medium	Provide training, guidelines, and user-friendly interfaces.

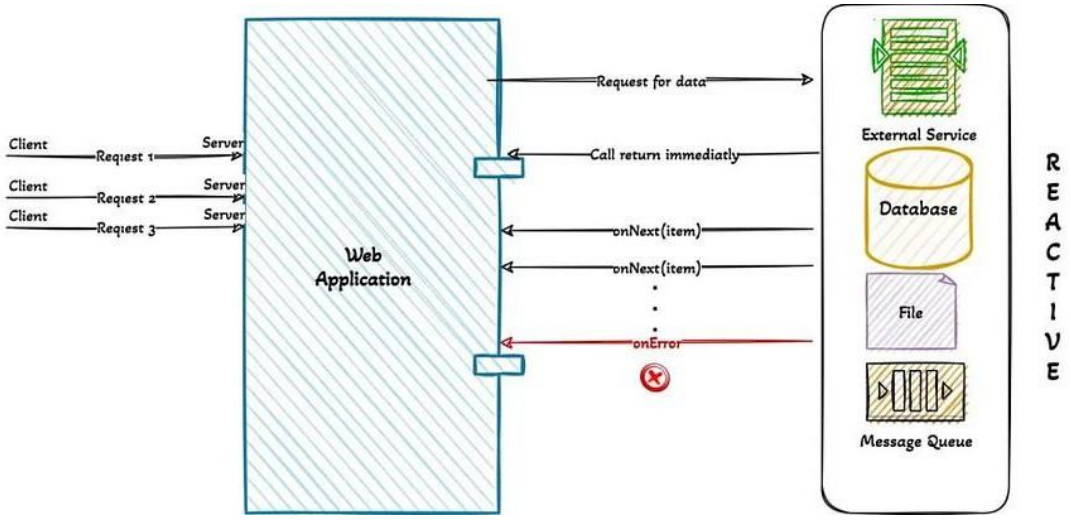

Fig: Threads for laptop catalog request

CHAPTER X: FUTURE SCOPE & CONCLUSION

10.1 Future Enhancements

- **Mobile App Integration:** Allow users to submit and track requests via mobile devices.
- **Automated Approval Workflows:** Implement AI rules to speed up approvals for standard requests.
- **Predictive Inventory Management:** Forecast laptop demand and stock levels using analytics.
- **Vendor Rating & Recommendation System:** Track vendor performance to optimize procurement.
- **Enhanced Reporting & Dashboards:** Add trend analysis, alerts, and KPI visualization for better decision-making.

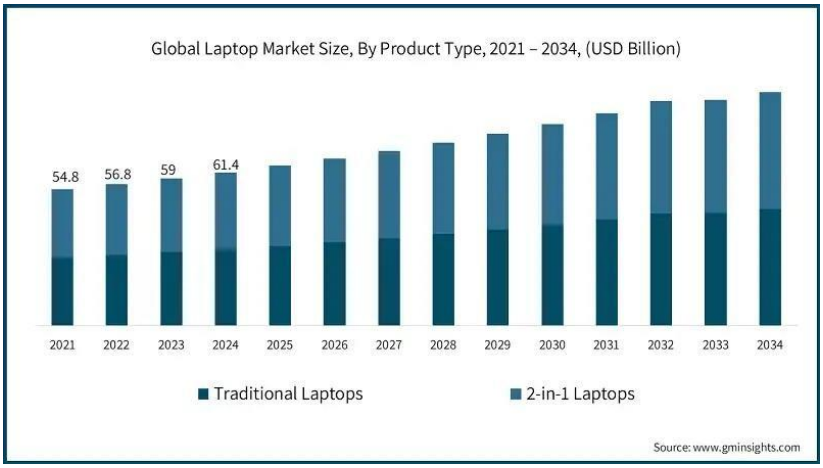

Fig: Future scope of Laptop Catalog Request Item

.1 Scalability Roadmap

- **Year 1:** Stabilization – Optimize core system and workflows
- **Year 2:** Horizontal Scaling – Add servers/cloud for higher request load
- **Year 3:** Feature Expansion – Analytics dashboards, automated approvals, predictive inventory
- **Year 4+:** Automation & AI – AI for prioritization, anomaly detection, process optimization → Future: Global/Enterprise Scaling – Multi-region supports with localized catalogs and SLAs.

10.3 Conclusion

The Laptop Catalog Request Item project streamlines the process of requesting, approving, and fulfilling laptop orders, improving accuracy, transparency, and efficiency. With structured workflows, monitoring dashboards, and data-driven insights, it reduces processing time, enhances user satisfaction, and supports informed decision-making. Future enhancements like automation, predictive analytics, and system integrations will further scale the solution, making it robust, adaptable, and aligned with organizational growth.

Expected Outcomes: - The Laptop Catalog Request Item project is expected to streamline the request and approval process, reducing processing time by **30–40%** and improving accuracy to **≥95%**. It will provide enhanced visibility through real-time dashboards, allowing monitoring of request status, vendor fulfilment rates of **≥95%**, and user satisfaction of **≥90%**. Additionally, the system will generate data-driven insights to optimize inventory planning and procurement decisions, leading to overall efficiency gains of **25–30%** and continuous process improvement.

Success Factors:

1. Accurate catalog data and up-to-date specifications.
2. Streamlined request, approval, and fulfillment workflows.
3. High user adoption through training and support.
4. Reliable vendor performance and timely deliveries.
5. Real-time monitoring, alerts, and feedback loops
6. Scalable system for future growth and enhancements.

CHAPTER XI: APPENDIX

Source code:

All codes are submitted in git-hub repository.

Github:

https://github.com/garudadrivasanthi/Laptop-Request-Catalog-Item/upload

Project Demo Link:

https://drive.google.com/file/d/1QKir1vdYgMxA1PUYwHYTBrI5OLEr6NqD/view?usp=drivesdk