# Assignment 1:

**Inventory management and optimizing Delivery Logistics.**

### Organizational Change Required to Adopt This Technology

To successfully implement demand forecasting and inventory management, the organization must undergo the following changes:

1. **Technology Adoption:** Implement AI-driven forecasting tools, ERP integration, and real- time data tracking.
2. **Process Optimization:** Shift from manual inventory tracking to automated, data-driven decision-making.
3. **Training & Upskilling:** Train employees on new forecasting software, AI analytics, and inventory optimization tools.
4. **Cross-Department Collaboration:** Align manufacturing, logistics, and sales teams to use real-time demand insights effectively.
5. **Policy Updates:** Redefine inventory restocking and distribution strategies based on predictive insights.
6. **Resources Required with Budget :-**

|  |  |  |
| --- | --- | --- |
| **Resource** | **Quantity** | **Estimated Cost (INR)** |
| **AI-Based Demand Forecasting Software** | 1 License | 15,00,000 |
| **Cloud Infrastructure (AWS/Azure)** | 1 Setup | 10,00,000 |
| **ERP & Inventory System Integration** | 1 Implementation | 8,00,000 |
| **IoT Sensors for Real-Time Monitoring** | 50 Units | 5,00,000 |
| **Data Scientists & Analysts** | 2 Professionals | 12,00,000  (Annual) |
| **Training Programs for Employees** | 50 Employees | 2,00,000 |
| **Hardware (Computers/Tablets)** | 10 Units | 3,00,000 |
| **Maintenance & Support** | Annual | 5,00,000 |
| **Total Estimated Budget** |  | **60,00,000 INR** |

1. **Current Problems**
   * **Overstocking & Understocking:** Perishable dairy products lead to wastage or stock shortages.
   * **Inefficient Delivery Management:** Manual dispatch planning leads to delays and high logistics costs.
   * **Lack of Demand Prediction:** No accurate forecasting leads to excess production or lost sales.
   * **Customer Dissatisfaction:** Delays in deliveries and unavailability of products.
2. **How This Project Solves These Problems**
   * **AI-Based Forecasting:** Accurately predicts demand to maintain optimal stock levels.
   * **Automated Logistics Optimization:** Ensures the quickest route and warehouse selection for deliveries.
   * **Real-Time Inventory Tracking:** IoT and cloud-based solutions provide live stock updates.
   * **Data-Driven Decision Making:** Reduces human error and improves efficiency.
   * **Customer Satisfaction Improvement:** Ensures product availability and fast delivery**.**
   * **Manual Data Handling:** Leads to errors, inefficiencies, and slow decision-making.
3. **Time Frame for ROI Recovery**

|  |  |
| --- | --- |
| **Phase** | **Timeline** |
| **Project Planning & Vendor Selection** | 1 Month |
| **Software Development & Integration** | 3 Months |
| **Testing & Implementation** | 2 Months |
| **Employee Training & System Adoption** | 1 Month |
| **Full-Scale Deployment** | 1 Month |
| **Total Time for ROI Recovery** | 8-12 Months |

* + **Expected Revenue Growth:** 15-20% increase due to better demand fulfillment.
  + **Cost Savings:** 10-15% reduction in wastage and logistics costs.

1. **Project Phases & Timeline**

|  |  |  |
| --- | --- | --- |
| **Phase Tasks Duration** | | |
| **Phase 1: Planning & Analysis** | Requirement gathering, stakeholder discussions, feasibility  study | 1 Month |
| **Phase 2: Design** | System architecture, UI/UX wireframing, database design | 1.5 Months |
| **Phase 3: Development** | AI demand forecasting model, inventory tracking system, integration with ERP | 3 Months |
| **Phase 4: Testing** | Unit testing, integration testing, UAT (User Acceptance Testing) | 1.5 Months |
| **Phase 5: Deployment** | Cloud setup, system rollout, training, initial monitoring | 1 Month |
| **Phase 6: Maintenance & Support** | Ongoing monitoring, bug fixes, performance improvements | Continuous |
|  |  |  |

1. **Tech Stack & Tools**

|  |  |
| --- | --- |
| **Component** | **Technology / Tool** |
| **Frontend** | **React.js / Angular** |

|  |  |
| --- | --- |
| **Backend** | **Python (Django) / Node.js** |
| **AI Model** | **Tensor Flow / Scikit-learn** |
| **Database** | **PostgreSQL / MySQL** |
| **Cloud Hosting** | **AWS / Azure** |
| **IoT Sensors** | **RFID, Barcode Scanners** |
| **ERP Integration** | **SAP / Oracle** |
| **DevOps** | **Docker, Kubernetes, Jenkins** |

1. **Resource Allocation**

|  |  |  |
| --- | --- | --- |
| **Role** | **Responsibility** | **Resources Required** |
| **Project Manager** | **Oversee development, timeline management** | **1** |
| **Business Analyst** | **Requirement gathering, documentation** | **1** |
| **UI/UX Designer** | **Design system UI & dashboards** | **1** |
| **Frontend Developers** | **Build web interfaces** | **2** |
| **Backend Developers** | **API & business logic**  **development** | **2** |
| **AI/ML Engineers** | **Develop demand forecasting algorithms** | **2** |
| **Database Administrator** | **Manage data storage & optimization** | **1** |
| **QA Testers** | **Perform software testing** | **2** |
| **DevOps Engineer** | **CI/CD setup & deployment** | **1** |

1. **Risk Mitigation Plan**

|  |  |
| --- | --- |
| **Risk Type** | **Mitigation Strategy** |
| **Data Accuracy Issues** | **Implement data validation and AI model training refinements** |
| **Integration Challenges** | **Use standardized APIs and modular approach for ERP connectivity** |
| **User Adoption Resistance** | **Conduct training sessions and provide ongoing support** |
| **Scalability Constraints** | **Use cloud-based architecture with auto-scaling capabilities** |
| **Cybersecurity Threats** | **Implement role-based access, encryption, and regular security audits** |
|  |  |

## 5. Deployment Strategy

* + **Pilot Phase:** Deploy system in one warehouse for testing.
  + **Gradual Rollout:** Expand to other locations based on performance.
  + **Full Deployment:** System goes live for all warehouses & distribution centers.

## Post-Deployment & Support

* + **User Feedback Collection:** Weekly reviews from warehouse teams.
  + **Performance Optimization:** AI model adjustments for better accuracy.
  + **Maintenance Plan:** Regular system updates, bug fixes, and feature enhancements.

|  |  |  |  |
| --- | --- | --- | --- |
| **Functional Requirement** | | | |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| **F-01** | **User Authentication** | **Users (Admin, Warehouse, Logistics, and Customer) must log in securely.** | **10** |
| **F-02** | **AI Demand Forecasting** | **The system must predict demand using AI and historical data.** | **9** |
| **F-03** | **Inventory Management** | **Real-time stock updates and tracking across multiple warehouses.** | **9** |
| **F-04** | **Order Processing** | **Customers should be able to place, modify, and track orders.** | **8** |
| **F-05** | **Warehouse Allocation** | **The system should allocate stock from the nearest available warehouse.** | **9** |
| **F-06** | **Route Optimization** | **AI should optimize delivery routes for the fastest shipment.** | **7** |
| **F-07** | **Real-Time Tracking** | **Live tracking of orders from warehouse to customer.** | **8** |
| **F-08** | **Report Generation** | **Generate reports on inventory, demand trends, and delivery performance.** | **10** |
| **Non-functional requirement specification** | | | |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| **NF-01** | **System Availability** | **The platform must have 99.9% uptime for continuous operations.** | **9** |
| **NF-02** | **Performance** | **Response time for requests should be <2 seconds.** | **9** |
| **NF-03** | **Scalability** | **Must handle increased demand and growing users dynamically.** | **8** |

|  |  |  |  |
| --- | --- | --- | --- |
| **NF-04** | **Security** | **Implement encryption, access control, and multi-factor authentication.** | **9** |
| **NF-05** | **Data Backup** | **Automatic daily backups to prevent data loss.** | **7** |
| **NF-06** | **Compliance** | **The system should adhere to GDPR & industry regulations.** | **10** |
| **NF-07** | **User-Friendly UI** | **The interface should be intuitive for all user roles.** | **8** |

* + **Break-Even Point:** Within 12 months based on efficiency improvements.

PROJECT ID: - P21231 VIRSION ID: 1.0.0

Author By – Mohammad Imran

1. **Document Revisions :-**

|  |  |  |
| --- | --- | --- |
| **Date** | **Author** | **Changes Made** |
| 3/30/2025 | Business Analyst | **Initial draft created** |
| 3/30/2025 | Business Analyst | **Added document revision table** |
| 3/31/2025 | Business Analyst | **Updated scope for inventory & delivery** |
| 3/31/2025 | Business Analyst | **Added more details on logistics** |

1. **Approvals :-**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Signature** | **Date** |
| **Project Sponsor** | **Rajesh Mehta** | **Director - Operations** |  | 3/31/2025 |
| **Business Owner** | **Anjali Sharma** | **Head of Supply Chain** |  | 3/31/2025 |
| **IT Manager** | **Sandeep Verma** | **IT Infrastructure Lead** |  | 3/31/2025 |
| **Business Analyst** | **Neha Kapoor** | **Lead Business Analyst** |  | 3/31/2025 |
| **Development Lead** | **Arjun Rao** | **Software Development Head** |  | 3/31/2025 |
| **Quality Assurance** | **Priya Nair** | **QA Manager** |  | 3/31/2025 |
| **Logistics Manager** | **Vikram Joshi** | **Delivery &**  **Distribution Head** |  | 3/31/2025 |
| **Finance Representative** | **Rohit Bansal** | **Finance Controller** |  | 3/31/2025 |

1. **RACI Matrix :-**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task / Activity** | **Project**  **Sponsor (Rajesh Mehta)** | **Business**  **Owner (Anjali Sharma)** | **IT**  **Manager (Sandeep Verma)** | **Business**  **Analyst (Neha Kapoor)** | **Dev**  **Lead (Arjun Rao)** | **QA**  **Manager (Priya Nair)** | **Logistics**  **Manager (Vikram Joshi)** | **Finance (Rohit Bansal)** |
| **Requirement Gathering** | **A** | **R** | **C** | **I** | **C** | **I** | **I** | **I** |
| **Solution Design & Architecture** | **C** | **C** | **R** | **A** | **R** | **C** | **I** | **I** |
| **Software Development** | **I** | **I** | **C** | **C** | **R** | **I** | **I** | **I** |
| **System Integration** | **I** | **I** | **R** | **C** | **A** | **C** | **I** | **I** |
| **Testing & Quality Assurance** | **I** | **I** | **C** | **C** | **C** | **R** | **I** | **I** |
| **Inventory Management Implementation** | **C** | **R** | **C** | **C** | **R** | **C** | **A** | **C** |
| **Logistics &**  **Delivery Optimization** | **C** | **A** | **C** | **C** | **R** | **C** | **R** | **C** |
| **Budget Approval** | **A** | **C** | **I** | **I** | **I** | **I** | **I** | **R** |

## Introduction

The **Quickest delivery to the customers and Inventory Management System** aims to optimize inventory levels and ensure the quickest delivery of dairy products. The system will use AI-driven analytics to predict demand accurately, reduce stock wastage, and streamline logistics.

## Business Goals

1. Improve **inventory management** to minimize overstocking and understocking.
2. Enable **faster and efficient delivery** to customers.
3. Reduce **operational costs** by automating supply chain decisions.
4. Increase **customer satisfaction** by ensuring product availability.
5. Enhance **data-driven decision-making** using AI and analytics.

## Business Objectives

1. Develop a **centralized inventory system** for real-time tracking.
2. Implement **AI-based demand forecasting** to optimize stock levels.
3. Automate **order processing and dispatch planning** for quick deliveries.
4. Integrate with **existing ERP and logistics management systems**.
5. Provide **real-time insights and analytics** for better supply chain decisions.

## Business Rules

1. Inventory levels must **automatically update** based on sales data.
2. Orders should be **allocated to the nearest warehouse** for faster dispatch.
3. Products with shorter shelf life must be **prioritized for delivery**.
4. Demand forecasting should use **historical sales and seasonal trends**.
5. Alerts should be triggered for **low stock levels** and **potential stockouts**.

## Background

The company manufactures dairy products, including ice cream and milk, and operates **multiple warehouses and manufacturing plants** across the country. Currently, **manual inventory tracking** and **inefficient delivery planning** cause significant wastage and delays. An AI-driven solution is required to **streamline operations** and improve customer service.

## Project Objective

1. Develop an AI-based **inventory management system** to maintain optimal stock levels.
2. Implement an **automated delivery planning system** to minimize delays.
3. Reduce **operational inefficiencies** through data-driven supply chain decisions.
4. Improve overall **profitability and customer satisfaction**.
5. Integrate the system with **existing ERP, sales, and logistics platforms**.

## Project Scope

### In-Scope Functionality

* + - 1. **AI-based demand forecasting** to predict stock requirements.
      2. **Real-time inventory tracking** with automated stock updates.
      3. **Automated order processing** and warehouse allocation.
      4. **Route optimization for fastest delivery** and cost reduction.

### Integration with ERP, sales, and logistics systems.

* + 1. **Out-of-Scope Functionality**
       1. **Manufacturing process automation** (only inventory and delivery management).
       2. **Direct customer order management** (handled by sales team).
       3. **Supplier management system** (focus is on inventory and delivery).
       4. **Third-party courier management** (only internal logistics are managed).

### Assumptions

1. The company will provide **historical sales data** for demand forecasting.**RP and warehouse systems** can integrate with the new solution.
2. Employees will be **trained** to use the new system.
3. Cloud-based infrastructure will be **accessible** across all locations.
4. The company has **sufficient budget** for full system implementation.

### Constraints

1. **Data Accuracy:** System efficiency depends on reliable historical data.
2. **Integration Complexity:** Existing ERP systems may require customization.
3. **Budget Limitations:** Implementation must stay within **₹60 lakh**.
4. **Technology Adoption:** Employees may resist moving from manual tracking.
5. **Regulatory Compliance:** System must adhere to food safety and logistics laws.

### Risks

* 1. **Technological Risks**

1. **System failures or downtime** could disrupt inventory tracking.
2. **Integration issues** with ERP and logistics software.
3. **Scalability concerns** if demand increases beyond initial projections.
4. **Cybersecurity threats** due to cloud-based data storage.
5. **AI model accuracy** may fluctuate based on market trends.

### Skills Risks

1. Employees may face **difficulty adapting** to the new system.

### Need for specialized AI and data analytics training.

1. Dependence on **external vendors** for system support.
2. Shortage of **technical expertise** for advanced AI model customization.
3. Lack of **logistics optimization knowledge** among staff.

### Political Risks

1. Changes in **government policies** on food safety and transportation.
2. **Import/export restrictions** on dairy products affecting supply chain.
3. **Regulatory approvals** may delay system deployment.
4. Potential **tax structure changes** affecting cost calculations.
5. Public protests or **policy shifts** affecting business operations.

### Business Risks

1. **Market demand fluctuations** impacting stock management.
2. **Competitor strategies** may force sudden adjustments.
3. **High initial investment** with uncertain ROI timeline.
4. **Data inaccuracy risks** leading to incorrect stock levels.
5. **Customer behavior changes** affecting order frequency.

### Requirements Risks

1. **Unclear project requirements** leading to scope creep.
2. **Incomplete stakeholder input** affecting solution accuracy.
3. **Misalignment with business goals** due to evolving priorities.
4. **Delayed approvals** causing project timeline extensions.
5. **Change requests** increasing development costs.

### Other Risks

1. **Natural disasters or supply chain disruptions** affecting inventory.
2. **Unexpected server failures** leading to downtime.
3. **Data migration challenges** from legacy systems.
4. **Resistance from stakeholders** delaying adoption.
5. **Unforeseen vendor issues** impacting software delivery.

### Business Process Overview

The **current business process** relies on manual inventory tracking and delivery scheduling, leading to inefficiencies and increased operational costs. The **proposed system** will automate these processes using AI-based demand forecasting and real-time inventory management, ensuring optimized stock levels and faster deliveries.

### Legacy System (AS-IS)

1. **Manual Inventory Management:** Warehouses track stock using spreadsheets and physical logs.
2. **Reactive Demand Planning:** Restocking decisions are based on previous orders, leading to stock imbalances.
3. **Inefficient Delivery Scheduling:** Orders are manually assigned to distribution centers, causing delays.
4. **Lack of Real-Time Visibility:** No automated system for tracking live inventory levels.
5. **High Operational Costs:** Excess stock leads to wastage, while shortages cause missed sales.

### Proposed Recommendations (TO-BE)

1. **AI-Driven Demand Forecasting:** Predicts inventory needs based on sales trends and seasonality.
2. **Automated Inventory Tracking:** Updates stock levels in real time across all warehouses.
3. **Optimized Delivery Scheduling:** AI assigns orders to the nearest warehouse for fastest dispatch.
4. **Cloud-Based Centralized System:** Ensures seamless integration with ERP and logistics tools.
5. **Reduced Wastage & Costs:** Minimizes overstocking, understocking, and delays.

### Business Requirements

1. **Real-Time Inventory Updates:** System must automatically reflect stock changes.
2. **AI-Based Demand Forecasting:** Historical and real-time data should predict demand.
3. **Order Fulfillment Optimization:** System should select the nearest warehouse for delivery.
4. **Integration with ERP & Logistics:** Must work seamlessly with existing enterprise systems.
5. **User-Friendly Dashboard:** Employees must easily access reports and stock status.

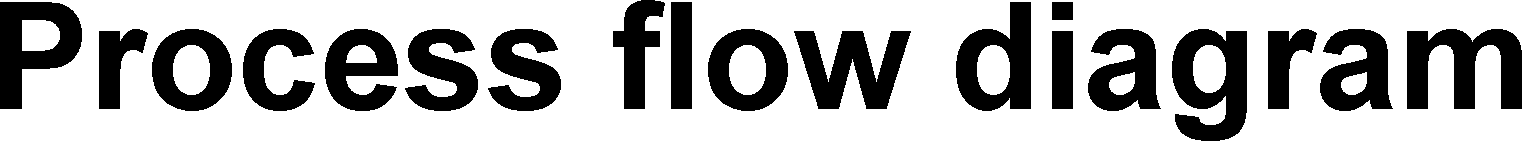
## Appendices

### List of Acronyms

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| AI | Artificial Intelligence |
| ERP | Enterprise Resource Planning |
| IoT | Internet of Things |
| ROI | Return on Investment |
| SKU | Stock Keeping Unit |

* 1. **Glossary of Terms**

1. **Demand Forecasting:** The process of predicting future inventory needs based on data.
2. **Real-Time Tracking:** Live monitoring of stock levels across warehouses.
3. **Warehouse Management System (WMS):** Software for handling inventory and logistics.
4. **Order Fulfillment:** The process of receiving, processing, and delivering customer orders.
5. **Stock Optimization:** Maintaining ideal stock levels to prevent excess or shortage.
   1. **Related Documents**
6. **Enterprise ERP Integration Guide**
7. **Inventory Management System Functional Specification**
8. **AI Demand Forecasting Model Documentation**
9. **Warehouse Logistics & Routing Strategy Report**
10. **User Training Manual for New System**



# Assignment 2:

### Letter to a client :-

**From**

**Mohammad Imran** Business Analyst **TechSolutions Pvt. Ltd.**

Email: [Iahmad726@gmail.com](mailto:Iahmad726@gmail.com) | Mob: 7905894933

Date: **March 30, 2025 To,**

**Mr. Rahul Mehta** Operations Manager **FreshDairy Ltd.**

123, Green Avenue, Mumbai, Maharashtra – 400001

### Subject: Introduction as Your Business Analyst for Demand Forecasting & Inventory Management Project

Dear Mr. Mehta,

I hope this email finds you well. My name is **Mohammad Imran**, and I am a **Business Analyst** at **TechSolutions Pvt. Ltd.** I am pleased to introduce myself as your primary contact for the **Demand Forecasting & Inventory Management Project**. My role is to collaborate with you and your team to understand your business processes, analyze current challenges, and ensure that our proposed solution aligns with your company’s goals.

To initiate the **business understanding process**, I will work closely with you to:

* Gather detailed requirements and expectations.
* Identify key operational challenges and areas for improvement.
* Define the project scope and success criteria.
* Ensure smooth coordination between stakeholders and technical teams.

I would love to schedule an initial discussion at your convenience to understand your specific needs. Please let me know a suitable time for a meeting.

Looking forward to working together on this project. Best regards,

### Mohammad Imran

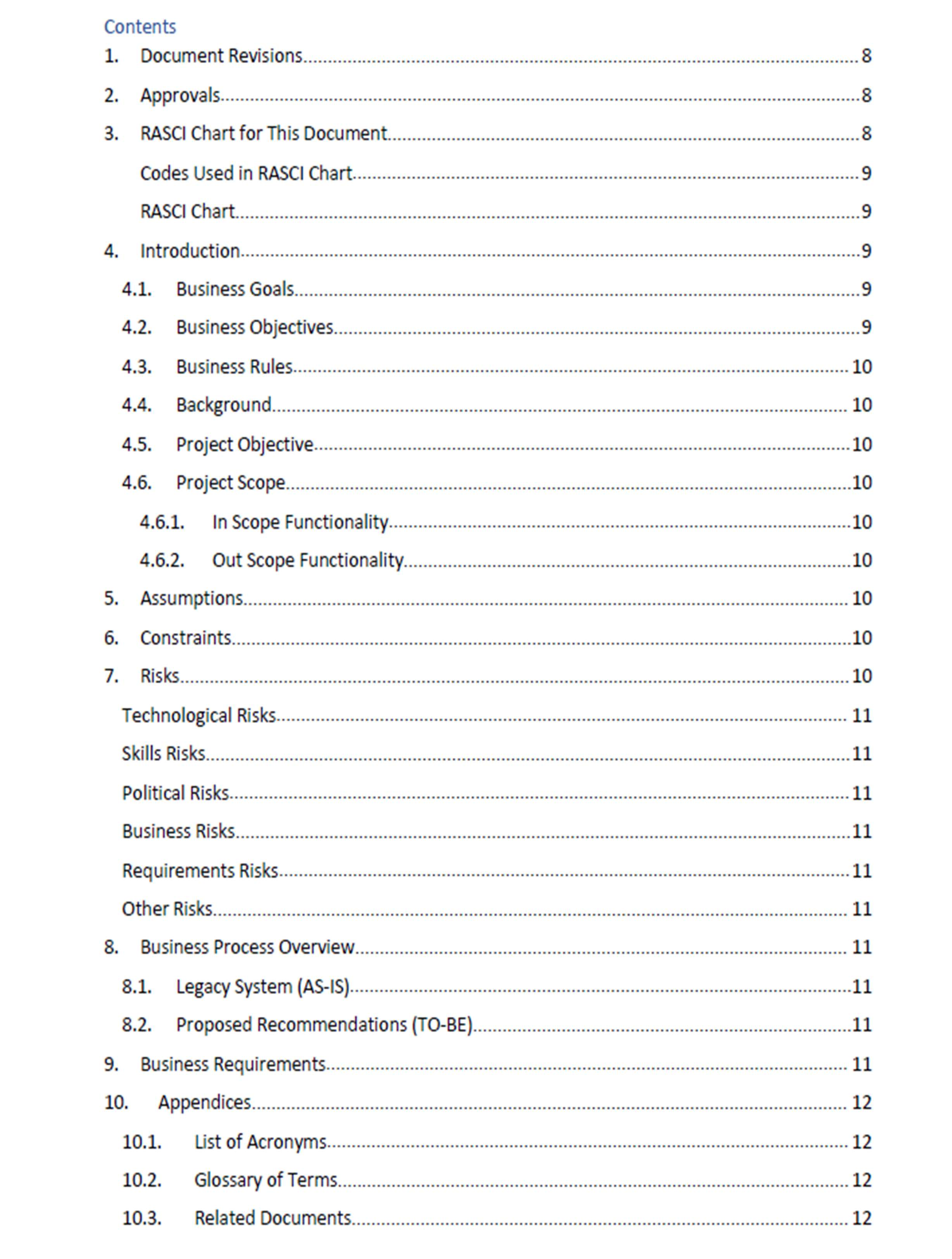
Business Analyst TechSolutions Pvt. Ltd.

Email: [amit.sharma@techsolutions.com](mailto:amit.sharma@techsolutions.com) Mo: +91 98765 43210

|  |  |
| --- | --- |
| **Project Name Ticketing system** | |
| **Customer name** | **Ticketing system** |
| **Project Version** | **1** |
| **Project Sponsor** | **Ticketing system** |
| **Project Manager** | **Mr. Ashish Thorat** |
| **Project Initiation date** | **[01-07-2021]** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Functional requirement** | | | |
| **ID** | **Req Name** | **Req Description** | **Priority** |
| F001 | User Login | The system shall allow users to log in using a username and password. | 1 |
| F002 | Role-Based Access | The system shall provide different access levels for  admins, support agents, and customers. | 1 |
| F003 | Ticket Creation | Users shall be able to create new support tickets by providing issue details. | 1 |
| F004 | Ticket Tracking | Users shall be able to view the status of their submitted tickets. | 2 |
| F005 | Ticket Assignment | Admins shall assign tickets to support agents based on availability. | 1 |
| F006 | Email Notifications | The system shall send email updates on ticket status changes. | 2 |
| F007 | Ticket Prioritization | Tickets shall have priority levels (Low, Medium, High, Critical). | 2 |
| F008 | Ticket Resolution | Support agents shall update tickets with resolutions before closing them. | 1 |
| F009 | Ticket History | Users shall be able to view past tickets and their resolutions. | 3 |
| F010 | Reporting & Analytics | Admins shall generate reports on ticket resolution time, agent performance, and issue trends. | 3 |
|  |  |  |  |
| **Non-functional requirement specification** | | | |
| **Req ID** | **Req Name** | **Req Description** | **Priority** |
| NF001 | System Availability | The system shall have 99.9% uptime availability. | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| NF002 | Performance | The system shall handle up to 10,000 concurrent users without performance degradation. | 1 |
| NF003 | Security | All data shall be encrypted, and user authentication shall follow multi-factor  authentication (MFA). | 1 |
| NF004 | Scalability | The system shall support future growth and additional features without performance issues. | 2 |
| NF005 | Response Time | The system shall respond to user actions within 2 seconds. | 2 |
| NF006 | Compliance | The system shall comply with GDPR and other relevant data  protection regulations. | 1 |
| NF007 | Cross-Platform Support | The system shall be accessible via web, mobile, and desktop applications. | 3 |
| NF008 | Backup & Recovery | The system shall perform automated daily backups and allow recovery within 30 minutes. | 2 |
| NF009 | User Experience | The UI shall be intuitive and easy to navigate for all user roles. | 3 |
| NF010 | Logging & Monitoring | The system shall maintain logs of all activities for audit and troubleshooting. | 3 |



1. **Document Revisions :-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Author** | **Changes Made** |
| **1** | **3/30/2025** | **Business Analyst** | **Initial draft of the Ticketing System**  **BRD** |
| **1.1** | **3/31/2025** | **Business Analyst** | **Added functional and non-**  **functional requirements** |
| **1.2** | **4/1/2025** | **Business Analyst** | **Updated process flow and RACI**  **matrix** |
| **1.3** | **4/2/2025** | **Business Analyst** | **Added risk assessment and**  **mitigation strategies** |

1. **Document Approvals**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Signature** | **Date** |
| **Project**  **Sponsor** | **Amit Khanna** | **CEO, XYZ Solutions** |  | **4/2/2025** |
| **Business**  **Owner** | **Priya Sharma** | **Head of Customer Support** |  | **4/2/2025** |
| **Business**  **Analyst** | **Rahul Mehta** | **Lead Business Analyst** |  | **4/2/2025** |
| **Solution**  **Architect** | **Neha Verma** | **Solution Architect** |  | **4/2/2025** |
| **Development**  **Lead** | **Arjun Singh** | **Technical Lead** |  | **4/2/2025** |
| **QA Lead** | **Ritu Joshi** | **Quality Assurance Manager** |  | **4/2/2025** |
| **IT Security** | **Sandeep Reddy** | **Security Analyst** |  | **4/2/2025** |
| **Compliance**  **Officer** | **Vikram Patel** | **Compliance & Risk Manager** |  | **4/2/2025** |

1. **RASCI Chart**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task / Activity** | **Responsible**  **(R)** | **Accountable (A)** | **Support (S)** | **Consulted**  **(C)** | **Informed (I)** |
| **Requirement Gathering** | **Business Analyst** | **Project Sponsor** | **Development Team** | **Business Owner, Customer**  **Support** | **Stakeholders** |
| **System Design & Architecture** | **Solution Architect** | **CTO** | **Development Team** | **Business Analyst, IT**  **Security** | **Project Sponsor** |
| **Development &**  **Coding** | **Development**  **Team** | **Technical Lead** | **QA Team** | **Business**  **Analyst** | **Stakeholders** |
| **Testing & Quality**  **Assurance** | **QA Team** | **QA Lead** | **Development**  **Team** | **Business**  **Analyst** | **Stakeholders** |
| **Security Compliance** | **IT Security**  **Team** | **Compliance Officer** | **Development**  **Team** | **Solution**  **Architect** | **Project Sponsor** |
| **User Training &**  **Documentation** | **Business**  **Analyst** | **Business Owner** | **Support Team** | **End Users** | **Stakeholders** |
| **Deployment & Go-**  **Live** | **DevOps**  **Team** | **Technical Lead** | **Support Team** | **IT Security** | **Stakeholders** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Ongoing**  **Maintenance & Support** | Support Team | Business Owner | Development Team | IT Security,  Business Analyst | Stakeholders |

## Introduction

The Ticketing System project aims to streamline issue tracking, automate ticket resolution, and enhance customer service efficiency. This document outlines the functional and non-functional requirements, scope, risks, and assumptions related to the project.

### Business Goals

* Improve response time for customer queries and technical issues.
* Automate ticket assignment and tracking for efficient issue resolution.
* Reduce manual workload and improve operational efficiency.
* Enhance customer satisfaction through faster issue resolution.
* Provide data-driven insights for continuous service improvement.

### Business Objectives

* Implement a centralized ticketing system for all customer requests.
* Automate ticket categorization, priority setting, and escalation.
* Ensure seamless integration with existing CRM and ITSM tools.
* Provide real-time status updates to customers and support teams.
* Enable reporting and analytics to identify trends and optimize operations.

### Business Rules

* Tickets will be categorized based on predefined priority levels.
* Urgent tickets will be escalated automatically if not resolved within SLA.
* Agents must update ticket status after every interaction.
* Customers will receive automated email/SMS notifications for ticket updates.
* Tickets cannot be closed without customer acknowledgment (where applicable).

### Background

The organization currently lacks a structured system for managing customer complaints and IT service requests. The manual process leads to delays, miscommunication, and unresolved issues. Implementing an automated ticketing system will address these inefficiencies.

### Project Objective

To develop a robust ticketing system that automates issue tracking, enhances customer support efficiency, and ensures timely resolution of reported problems through a structured and scalable platform.

### Project Scope

* + 1. **In-Scope Functionality**
* User authentication and role-based access.
* Ticket creation, assignment, and escalation workflows.
* Automated notifications and SLA tracking.
* Integration with CRM and ITSM tools.
* Reporting and analytics dashboard.
  + 1. **Out-Scope Functionality**
       - Social media ticket integration.
       - AI-powered chatbots for self-service support (future enhancement).
       - Multi-language support beyond English (future consideration).

## Assumptions

* Users will have access to the internet and required credentials.
* Integration with third-party systems will be feasible.
* Users will undergo training for smooth adoption.
* System performance will meet standard SLA requirements.

## Constraints

* Budget limitations for additional third-party tool integrations.
* Limited support for non-web-based ticketing requests.
* Compliance with internal IT security policies and GDPR regulations.
* Dependence on external vendors for CRM/ITSM integration.

## Risks

### Technological Risks

* Integration challenges with legacy systems.
* System downtime affecting ticket resolution.

### Skills Risks

* Lack of trained staff to operate the system effectively.
* Resistance to change from employees.

### Political Risks

* Conflicting priorities within IT and customer support teams.
* Resistance from departments reluctant to automate processes.

### Business Risks

* Increased workload during system transition phase.
* Delays in adoption affecting customer satisfaction.

### Requirements Risks

* Changes in requirements after development starts.
* Incomplete understanding of user needs leading to rework.

### Other Risks

* Data privacy concerns while storing sensitive customer data.
* Scalability issues if the system needs expansion.

## Business Process Overview

### Legacy System (AS-IS)

* Manual ticket logging via emails and phone calls.
* Delays in ticket resolution due to lack of automation.
* Poor tracking and reporting of resolved/unresolved tickets.

### Proposed Recommendations (TO-BE)

* Automated ticket assignment and escalation.
* Centralized dashboard for real-time tracking.
* SLA-based ticket prioritization.

## Business Requirements

The business requirements will define system capabilities, user interactions, and performance expectations.

## Appendices

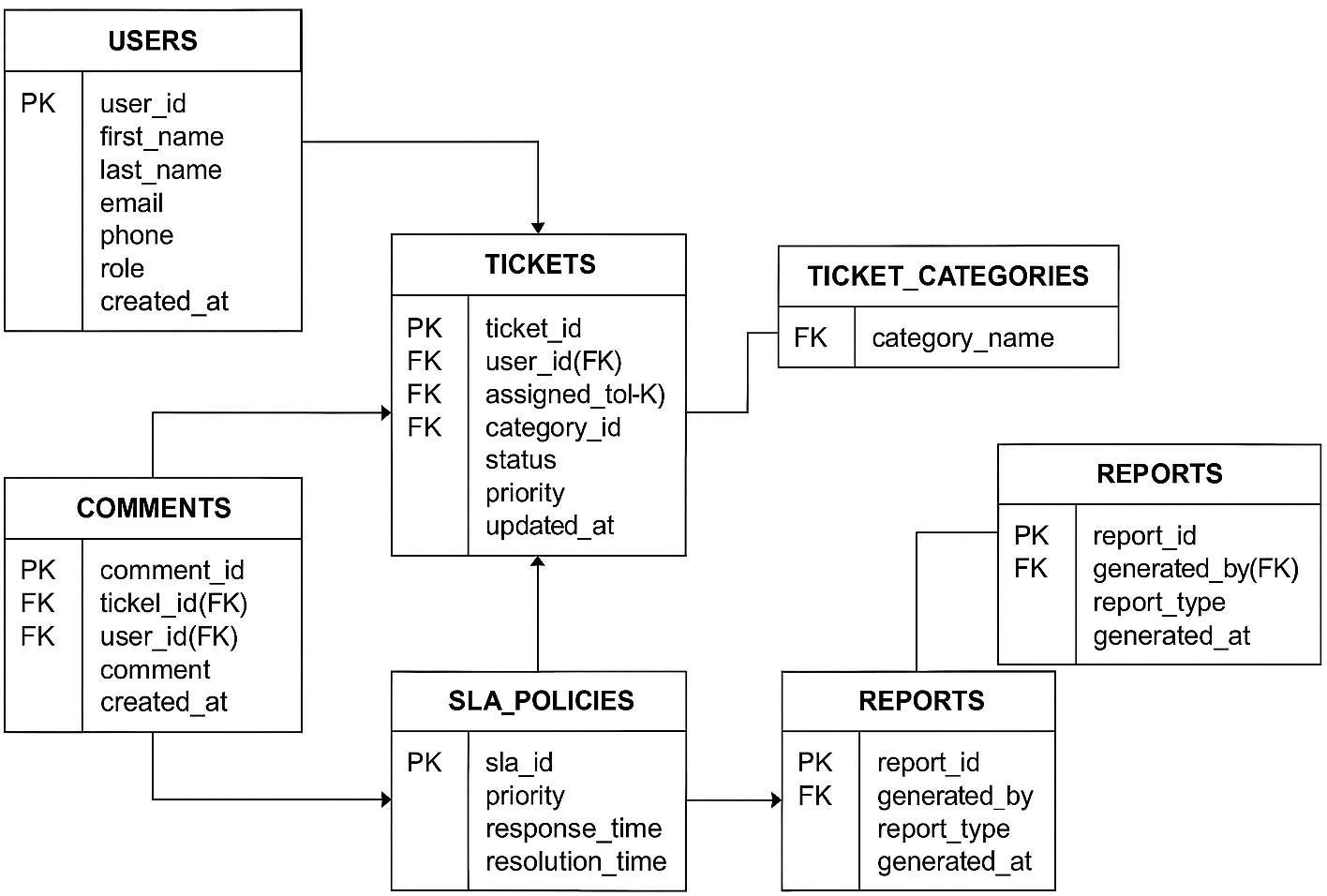
### List of Acronyms

* **SLA** – Service Level Agreement
* **CRM** – Customer Relationship Management
* **ITSM** – IT Service Management

### Glossary of Terms

* **Ticket** – A customer request or issue logged in the system.
* **Escalation** – Automatic prioritization of unresolved high-priority tickets.

1. **Entity relationship diagram**



### User story of shopping from ecommerce.

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| **User Story 1** | **TASK 1** | | **Priority: High** |
| **As a Customer, I want to register on the platform, so that I can use the app to shop** | | | |
| **BV:1000** | | **CP:2** | |
| **Acceptance Criteria:**  **User must be able to input valid personal information.**  **A confirmation email/SMS is sent upon successful registration.**  **Registration must ensure unique user identification.** | | | |

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| **User Story 2** | **TASK 2** | | **Priority: High** |
| **As a Customer, I want to log in using my registered credentials, so that I can access my account.** | | | |
| **BV:1000** | | **CP:2** | |
| **Acceptance Criteria:**  **User must be able to log in using email/phone and password.**  **Two-factor authentication should be available.**  **Incorrect credentials should display an error message.** | | | |

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| **User Story 3** | **TASK 3** | | **Priority: High** |
| **As a Customer, I want to browse products, so that I can explore available items.** | | | |
| **BV:1000** | | **CP:5** | |
| **Acceptance Criteria:**  **Users can view product categories and search for products.**  **Product images, descriptions, and prices must be displayed.**  **Filters and sorting options should be available.** | | | |

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| **User Story 4** | **TASK 5** | | **Priority: High** |
| **As a Customer, I want to view product details, so that I can make an informed purchase decision.** | | | |
| **BV:1000** | | **CP:3** | |
| **Acceptance Criteria:**  **Clicking on a product should open its detailed page.**  **Users should see high-quality images, specifications, and reviews.**  **"Add to Wishlist" and "Add to Cart" options should be available.** | | | |

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| **User Story 5** | **TASK 8** | | **Priority: High** |
| **As a Customer, I want to add products to my cart, so that I can purchase multiple items in one transaction.** | | | |
| **BV:1000** | | **CP:8** | |
| **Acceptance Criteria:**  **Users should be able to add/remove products from the cart.**  **The cart should display total price, discounts, and estimated delivery time.**  **Quantity selection should be available.** | | | |

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| **User Story 6** | **TASK 13** | | **Priority: High** |
| **As a Customer, I want to apply discount coupons, so that I can save money on my purchase.** | | | |
| **BV:1000** | | **CP:13** | |
| **Acceptance Criteria:**  **Users can enter and apply valid coupon codes. Discount should reflect in the order total.**  **Expired or invalid coupons should show error messages.** | | | |

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| **User Story 7** | **TASK 21** | | **Priority: High** |
| **As a Customer, I want to enter my delivery address, so that I can receive my order at the correct location.** | | | |
| **BV:1000** | | **CP:08** | |
| **Acceptance Criteria:**  **Users must input a valid address with a postal code.**  **Address should be saved for future use.**  **Google Maps API should be integrated for easy address selection.** | | | |

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| **User Story 8** | **TASK 34** | | **Priority: Medium** |
| **As a Customer, I want to select a payment method, so that I can complete my purchase securely.** | | | |
| **BV:500** | | **CP:05** | |
| **Acceptance Criteria:**  **Payment options should include Credit/Debit cards, UPI, and Wallets.**  **Payment gateway should be secure with SSL encryption.**  **Payment failures should prompt retry options.** | | | |

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| **User Story 9** | **TASK 55** | | **Priority: Medium** |
| **As a Customer, I want to receive an order confirmation, so that I can track my purchase.** | | | |
| **BV:500** | | **CP:05** | |
| **Acceptance Criteria:**  **A confirmation email/SMS should be sent after a successful order.**  **Users should receive a tracking ID.**  **The estimated delivery date should be displayed.** | | | |

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| **User Story 10** | **TASK 89** | | **Priority: Medium** |
| **As a Customer, I want to track my order status, so that I know when to expect delivery.** | | | |
| **BV:500** | | **CP:05** | |
| **Acceptance Criteria:**  **Order status should include "Processing," "Shipped," "Out for Delivery," and "Delivered." A tracking link should be available.**  **Push notifications should update the user about status changes.** | | | |

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| **User Story 11** | **TASK 144** | | **Priority: Medium** |
| **As a Customer, I want to cancel my order before it is shipped, so that I can change my purchase decision.** | | | |
| **BV:1000** | | **CP:02** | |
| **Acceptance Criteria:**  **Users can cancel an order within a specified time. Refund should be initiated if payment was made. Users should receive a cancellation confirmation.** | | | |

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| **User Story 12** | **TASK 233** | | **Priority: Medium** |
| **As a Customer, I want to return a product, so that I can get a replacement or refund.** | | | |
| **BV:1000** | | **CP:02** | |
| **Acceptance Criteria:**  **Users can initiate a return request within the return period.**  **The return process should include reason selection and image upload.**  **A return pickup schedule should be displayed.** | | | |

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| **User Story 13** | **TASK 377** | | **Priority: Medium** |
| **As a Customer, I want to review my purchase history, so that I can track my past orders.** | | | |
| **BV:1000** | | **CP:05** | |
| **Acceptance Criteria:**  **Users should be able to view order details, including invoices.**  **Filter by date and status should be available. Reordering option should be available for previous purchases.** | | | |

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| **User Story 14** | **TASK 610** | | **Priority: Medium** |
| **As a Customer, I want to contact customer support, so that I can resolve my queries.** | | | |
| **BV:1000** | | **CP:05** | |
| **Acceptance Criteria:**  **Users should access chat, email, and phone support.**  **A ticketing system should log complaints and queries.**  **FAQ and chatbot support should be available for common issues.** | | | |

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| **User Story 15** | **TASK 987** | | **Priority: Medium** |
| **As a Customer, I want to give product ratings and reviews, so that I can share my shopping experience.** | | | |
| **BV:1000** | | **CP:05** | |
| **Acceptance Criteria:**  **Users can give star ratings and write detailed reviews.**  **Reviews should be moderated before publishing. Verified purchase tags should be added to reviews.** | | | |

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| **User Story 16** | **TASK 1597** | | **Priority: Medium** |
| **As a Customer, I want to receive personalized product recommendations, so that I can find relevant products easily.** | | | |
| **BV:1000** | | **CP:05** | |
| **Acceptance Criteria:**  **AI-based recommendations based on browsing and purchase history.**  **Users should be able to like/dislike recommendations.**  **Trending products should be displayed.** | | | |

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| **User Story 21** | **TASK 2584** | | **Priority: Low** |
| **As a Customer, I want to refer friends to the platform, so that I can earn rewards.** | | | |
| **BV:400** | | **CP:02** | |
| **Acceptance Criteria:**  **Users should get a unique referral code.**  **Referrals should be tracked and rewards should be issued.**  **Fraud detection should be in place for misuse.** | | | |

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| **User Story 22** | **TASK 4181** | | **Priority: Low** |
| **As a Customer, I want to track my refunds, so that I know when I will receive my money back.** | | | |
| **BV:1000** | | **CP:02** | |
| **Acceptance Criteria:**  **Users should see refund status in their order history.**  **Estimated time for refunds should be displayed. Notifications should be sent when a refund is processed.** | | | |

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| **User Story 23** | **TASK 6765** | | **Priority: Low** |
| **As a Customer, I want to manage my saved payment methods, so that I can make checkout easier.** | | | |
| **BV:1000** | | **CP:05** | |
| **Acceptance Criteria:**  **Users can add, edit, and remove payment methods. Secure encryption should be used.**  **A default payment method can be set.** | | | |

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| **User Story 24** | **TASK 10946** | | **Priority: Low** |
| **As a Customer, I want to subscribe to newsletters, so that I can stay updated on new offers** | | | |
| **BV:500** | | **CP:05** | |
| **Acceptance Criteria:**  **Users can opt-in or out of promotional emails. Email categories should be available (Deals, New Arrivals, etc.).**  **GDPR compliance should be ensured.** | | | |

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| **User Story 25** | **TASK 17711** | | **Priority: Low** |
| **As a Customer, I want to set up auto-reorder for essential products, so that I never run out.** | | | |
| **BV:500** | | **CP:03** | |
| **Acceptance Criteria:**  **Users can choose reorder frequency.**  **Auto-payment should be enabled for subscribed products.**  **Notifications should be sent before auto- reordering.** | | | |

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| **User Story 26** | **TASK 28657** | | **Priority: Low** |
| **As a Customer, I want to view product comparisons, so that I can choose the best option.** | | | |
| **BV:500** | | **CP:08** | |
| **Acceptance Criteria:**  **Users can compare up to 5 products side by side. Feature highlights and differences should be displayed.**  **Price and rating comparison should be included.** | | | |

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| **User Story 27** | **TASK 46368** | | **Priority: Low** |
| **As a Customer, I want to buy gift cards, so that I can gift online shopping credit.** | | | |
| **BV:500** | | **CP:08** | |
| **Acceptance Criteria:**  **Users can purchase and send digital gift cards. Gift card balance should be viewable.**  **Expiry dates and usage terms should be displayed.** | | | |

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| **User Story 28** | **TASK 75025** | | **Priority: Low** |
| **As a Customer, I want to request an invoice, so that I can use it for tax or business purposes.** | | | |
| **BV:100** | | **CP:01** | |
| **Acceptance Criteria:**  **Users should receive a PDF invoice via email. Invoice should contain GST details if applicable. Bulk invoice download should be available.** | | | |

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| **User Story 29** | **TASK 121393** | | **Priority: Low** |
| **As a Customer, I want to use dark mode, so that I can shop comfortably at night.** | | | |
| **BV:1000** | | **CP:02** | |
| **Acceptance Criteria:**  **Users should be able to toggle dark/light mode. UI should be optimized for readability.**  **The setting should be saved across sessions.** | | | |

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| **User Story 30** | **TASK 196418** | | **Priority: Low** |
| **As a Customer, I want to log out securely, so that my account remains protected.** | | | |
| **BV:1000** | | **CP:08** | |
| **Acceptance Criteria:**  **Users can log out from all devices. Session timeout should be configurable.**  **A confirmation message should be shown before logout.** | | | |