**Assignment -1**

**1.Please make a BRD which can be presented to the client along with a complete development and resource plan.**

**1. Document Revisions**

**Document** **Name:** Ice-Cream and Milk Product Inventory & Delivery Management System

**Version:** 1.0

**Date:** 01-03-2025

**Prepared** **by:** Vedant Mulay **Reviewed** **by:** Siddhesh **Approved** **by:** Rohit

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Revision Number** | **Date** | **Author** | **Description of Changes** | **Reviewer** | **Approval Date** |
| 0.1 | 14/01/25 | Vedant Mulay | Initial draft of the project documentation | XYZ | 15/01/25 |
| 0.2 | 20/01/25 | Vedant Mulay | Added project objectives and success criteria | XYZ | 21/01/25 |
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| 0.4 | 30/01/25 | Vedant Mulay | Completed functional requirements and requirement traceability  matrix | XYZ | 01/02/25 |
| 0.5 | 05/02/25 | Vedant Mulay | Updated priority and status in requirement traceability  matrix | XYZ | 06/02/25 |
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| 0.8 | 25/02/25 | Vedant Mulay | Final review and formatting adjustments | XYZ | 26/02/25 |

**2. Approvals**

|  |  |  |  |
| --- | --- | --- | --- |
| **Role** | **Name** | **Signature** | **Date** |
| Project Sponsor | Mr. Patil | [Signature] | 15/01/25 |
| Business Owner | Sagar K | [Signature] | 15/01/25 |
| Project Manager | Harshal | [Signature] | 15/01/25 |
| Business Analyst | Vedant Mulay | [Signature] | 16/01/25 |
| Technical Lead | Bhushan M | [Signature] | 16/01/25 |
| Quality Assurance Lead | Sneha P | [Signature] | 17/01/25 |
| Stakeholder Representative | Anvita | [Signature] | 18/01/25 |
| IT Department Head | Pratik P | [Signature] | 18/01/25 |

**3. RASCI**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stakeholder** | **Responsibl e (R)** | **Accountable (A)** | **Consulted (C)** | **Informed (I)** |
| **Plant Owner** |  |  | C | I |
| **Project Manager** | R | A |  |  |
| **Business Analyst** | R |  |  |  |
| **UI/UX Designers** | R |  |  |  |
| **Developer** | R |  |  |  |
| **Testers** | R |  |  |  |
| **Trainers** | R |  |  |  |
| **Inventory Manager** |  |  | C | I |
| **Plant Staff** |  |  | C |  |

**4. Introduction**

**4.1. Business Goals**

The primary goal of the Ice-Cream and Milk Product Inventory & Delivery Management System is to efficiently manage inventory across multiple manufacturing plants and warehouses. Ensure the quickest possible delivery of ice-cream and milk products to customers. Reduce inventory wastage by tracking expiry dates and storage conditions. Optimize route planning for faster deliveries.

* 1. **Streamlined** **Inventory** **Management**: Ensure real-time monitoring of inventory levels across all warehouses and plants to reduce spoilage and optimize stock levels.
  2. **Enhanced** **Delivery** **Efficiency**: Implement a system to identify the fastest delivery routes and automate order allocation based on proximity and inventory availability.
  3. **Improved** **Customer** **Satisfaction**: Minimize order fulfilment time and ensure product freshness at delivery.

**4.2. Business Objectives**

1. Develop a centralized system to track and manage inventory across all locations.
2. Automate order processing, allocation, and dispatch based on inventory and location proximity.
3. Integrate delivery route optimization with real-time traffic and weather data.
4. Reduce inventory wastage by implementing an expiry-date tracking mechanism.
5. Enable reporting and analytics for better decision-making and demand forecasting.

**4.3. Business Rules**

1. Inventory must be updated in real-time upon receipt, dispatch, or adjustment.
2. Orders should only be fulfilled if the inventory is available and meets the required shelf- life criteria.
3. Delivery routes must prioritize freshness while minimizing transportation costs.
4. Customer priority orders (e.g., bulk orders) must be flagged for immediate action.
5. Warehouse reordering thresholds should trigger automated purchase orders.

**4.4. Background**

The company operates multiple manufacturing plants and warehouses across the country. With increasing demand, they are facing challenges in inventory management and timely deliveries. An advanced system is required to optimize these processes and improve efÏciency.

* 1. **Project** **Objective**

Develop a centralized software solution that integrates inventory management with an intelligent delivery system to ensure optimal stock levels and the fastest possible order fulfillment.

* 1. **Project** **Scope**

**In-Scope** **Functionality**

* + Inventory tracking (stock levels, expiry dates, storage conditions).
  + Automated order processing and fulfillment.
  + Route optimization and delivery tracking.
  + Integration with existing ERP systems.
  + Role-based access control.

**Out** **of** **Scope** **Functionality**

* + Manufacturing process management.
  + Customer relationship management (CRM).
  + Payment processing system.

1. **Assumptions**

* The company has the necessary infrastructure to support the new system.
* Employees will be trained on the new software.
* The system will integrate with existing logistics providers.

1. **Constraints**

* Budget limitations for software development and implementation.
* Existing infrastructure compatibility with the new system.
* Data security and compliance with regulatory requirements.

1. **Risks**

**Technical Risks:**

Integration issues with existing systems.

System scalability with increasing business demand.

**Political Risks:**

Resistance from employees due to new processes and technology.

Potential vendor lock-in with third-party tools.

**Requirement Risks:**

Incomplete or evolving requirements from stakeholders.

**Business Risks:**

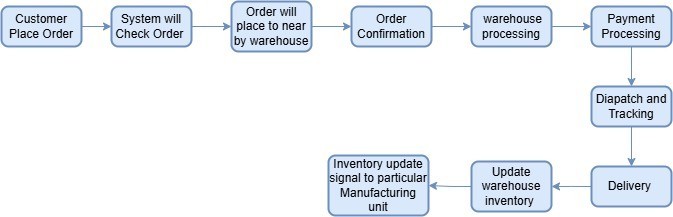
Downtime during system rollout.

Customer dissatisfaction due to transition delays.

1. **Business** **Process** **Overview** **AS-IS** **Process** **(Current** **State)**
2. Inventory is managed manually at each warehouse.
3. Orders are processed based on phone calls or emails.
4. Delivery routes are determined manually.

**TO-BE** **Process** **(Future** **State)**

1. Inventory is updated in real-time through the system.
2. Orders are automatically assigned to the nearest warehouse with available stock.
3. Delivery routes are optimized using AI-based logistics management.

**Business Process Flow**

**Business Requirement**

|  |  |  |  |
| --- | --- | --- | --- |
| **Req ID** | **Requirement Name** | **Requirement Description** | **Priority** |
| BR001 | Centralized Inventory Management | A system to track and manage inventory across all plants and warehouses. | High |
| BR002 | Real-Time Stock Updates | Live updates of stock levels for raw materials and finished goods. | High |
| BR003 | Expiry Tracking | Track perishable goods and notify nearing expiration products. | High |
| BR004 | Warehouse Capacity Management | Monitor and optimize space utilization in warehouses. | Medium |
| BR005 | Demand Forecasting | Predict demand based on seasonality, region, and historical data. | High |
| BR006 | Order Management System | Manage customer orders from placement to delivery. | High |
| BR007 | Route Optimization | Suggest the quickest delivery route based on location, traffic, and distance. | High |
| BR008 | Delivery Scheduling | Auto-schedule deliveries based on order priority and availability of vehicles. | High |
| BR009 | Supplier Integration | Interface to manage and communicate with raw material suppliers. | Medium |
| BR010 | Quality Check Logs | Track QC processes for milk and ice-cream at different stages. | Medium |
| BR011 | Temperature Monitoring | Monitor temperature levels in storage and transit for perishable products. | High |
| BR012 | Batch and Lot Tracking | Track production batches from manufacturing to delivery. | High |
| BR013 | Customer Feedback Integration | Collect and analyze delivery and product feedback. | Medium |
| BR014 | Real-Time Vehicle Tracking | GPS tracking of delivery vehicles for monitoring and alerts. | High |
| BR015 | Inventory Reorder Alerts | Notify when stock of raw materials or finished goods falls below threshold. | High |
| BR016 | Mobile App for Delivery Agents | Mobile access for delivery agents to manage and confirm deliveries. | High |
| BR017 | Analytics Dashboard | Provide insights on sales, delivery times, wastage, and inventory turnover. | High |
| BR018 | Multi-location Support | System should support data and operations from all plant and warehouse locations. | High |
| BR019 | Integration with ERP Systems | Interface with existing ERP or financial systems for seamless data flow. | Medium |
| BR020 | Role-based Access Control | Ensure secure access with roles like Admin, Warehouse Manager, Delivery Agent, etc. | High |

1. **Development Plan and Resources Allocation**

|  |  |  |
| --- | --- | --- |
| **Role** | **Responsibilities** | **No.** **of** **Resources** |
| Business Analyst | Requirement gathering, documentation | 1 |
| Project Manager | Project execution, timeline tracking | 1 |
| Backend Developer | Database, APIs | 2 |
| Frontend Developer | UI/UX implementation | 2 |
| QA Engineer | Testing and quality assurance | 2 |
| DevOps Engineer | Deployment and server maintenance | 1 |

**Development Timeline**

|  |  |  |
| --- | --- | --- |
| **Phases** | **Description** | **Time Duration (Weeks)** |
| **1st** | Requirement gathering, stakeholder workshops, and system design | **4** |
| **2nd** | Development of core modules | **12** |
| **3rd** | Integration with external systems | **6** |
| **4th** | Testing and quality assurance | **4** |
| **5th** | Deployment, training, and support | **4** |

**10. Appendices**

**10.1. List of Acronyms**

* UAT-User Acceptance Testing
* BRD- Business Requirement Document BR- Business Requirement
* UI- User interference
* UX- User experience

**10.2. Related Documents**

* Functional Specifications
* Technical Design Document
* This Business Requirements Document (BRD) provides a comprehensive overview of the objectives, scope, requirements, and other relevant aspects of the Ice-Cream and Milk Product Inventory & Delivery Management System project.

**Assignment** **2**

1. **Write** **an** **introduction** **letter** **to** **a** **client** **introducing** **yourself** **as** **a** **business** **analyst** **in** **charge** **of** **working** **with** **the** **client** **and** **his** **team** **to** **start** **the** **business** **understanding** **process.**

**Subject:** Resource introduction as Business analyst

Hello Team,

I hope this message finds you well. My name is Vedant Mulay, and I am delighted to introduce myself as the Business Analyst assigned to collaborate with you and your team on this exciting project.

Understanding the challenges and opportunities within the manufacturing and logistics sectors, particularly in delivering exceptional customer service, is a domain I am passionate about. With your vision of managing inventory and ensuring the quickest delivery of your ice-cream and milk products, my role will be to work closely with you to transform these goals into a robust, tailor- made software solution.

To begin, I aim to thoroughly understand your current processes, challenges, and aspirations. Together, we will explore your operational workflows, identify key requirements, and map out a strategic plan that aligns with your business objectives. Your insights will be invaluable in ensuring the solution we design is practical, scalable, and optimized for your unique needs.

I look forward to discussing your expectations and gathering inputs from your team during our initial meetings. In the meantime, please feel free to share any documents, current processes, or initial thoughts that could help us hit the ground running.

Thank you for the opportunity to collaborate on this project. I am confident that, together, we will develop a solution that adds significant value to your business operations. Please let me know a convenient time for us to connect further.

Looking forward to working with you.

Best regards,

Vedant Mulay

Business Analyst

+91 9834173553

1. **Prepare a brief BRD and SRS for a project- online store.**

**BRD**

**Document** **Name-** Ticketing System

**Version:** **1.0**

**Date:** 01-03-2025

**Prepared** **By:** Vedant Mulay **Reviewed** **By:** Bhushan **Approved** **By:** Rahul

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| Business Analyst | Vedant Mulay | [Signature] | 16/01/25 |
| Technical Lead | Bhushan M | [Signature] | 16/01/25 |
| Quality Assurance Lead | Sneha P | [Signature] | 17/01/25 |
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| IT Department Head | Pratik P | [Signature] | 18/01/25 |

**RACI**

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| --- | --- | --- | --- | --- |
| **Stakeholder** | **Responsibl e (R)** | **Accountable (A)** | **Consulted (C)** | **Informed (I)** |
| **Client** |  |  | C | I |
| **Project Manager** | R | A |  |  |
| **Business Analyst** | R |  |  |  |
| **UI/UX Designers** | R |  |  |  |
| **Developer** | R |  |  |  |
| **Testers** | R |  |  |  |
| **Trainers** | R |  |  |  |
| **Client-side Staff 1** |  |  | C | I |
| **Client-side Staff 2** |  |  | C |  |

**4. Introduction:**

**4.1 Business Goals**

* **Streamline Issue Resolution**
* Enable users to easily raise and track tickets while ensuring quick and efficient resolution by support teams**.**
* **Enhance Transparency**
* Provide users and stakeholders with real-time updates on ticket status and resolution timelines.
* **Improve Accountability**
* Introduce clear ownership of tickets through automated assignments and escalation mechanisms.
* **Boost Operational Efficiency**
* Automate routine processes such as ticket routing and SLA monitoring to reduce manual intervention and errors.
* **Enable Data-Driven Decisions**
* Generate actionable insights through reporting and analytics to identify patterns, improve service quality, and optimize resources.

**4.2 Business Objectives**

* **Enhanced Customer Satisfaction**: By reducing resolution time and ensuring timely support through SLA compliance.
* **Optimized Support Team Performance:** By providing tools for assigning tickets to the appropriate agents, managing workloads, and tracking performance.
* **Better Decision-Making:** By offering detailed reports on ticket trends, SLA performance, and agent efficiency.
* **Cost Efficiency:** By automating routine support processes, reducing human error, and speeding up the resolution process, leading to a reduction in operational costs.

**4.3 Business Rules**

* Tickets must be assigned to agents within 15 minutes of creation.
* Tickets cannot be closed until all required information is provided, and the issue is fully
* resolved.
* Support agents must adhere to the SLAs defined for each ticket type.
* A ticket must be reopened if a customer reports the issue again within 30 days of closure.

**4.4 Background**

The company’s current ticketing system is inefficient, causing slow response times, missed SLAs, and manual processing. To address these issues, the company will implement a new Ticketing System that automates ticket management, tracks SLAs, integrates a knowledge base, and provides detailed reporting. This system will streamline support processes, improve customer satisfaction, and ensure compliance with SLAs.

The project aims to enhance efficiency, reduce costs, and provide better data insights for decision-making. Key stakeholders include customer support, IT, and business leadership. The project will be completed in 6 months, with phased rollout and ongoing support.

**4.5 Project Objective**

The project objective of the Ticketing System Project is to design and implement a centralized, user-friendly platform that allows users to seamlessly raise, track, and manage support tickets. The system will streamline issue resolution by enabling faster response times, improving accountability through automated ticket ownership, and enhancing transparency with real-time status updates. By integrating automation and analytics, the project aims to increase operational efficiency and provide actionable insights for continuous service improvement.

**4.6 Project Scope**

**In-Scope:**

* Development of a web-based ticketing system for internal and external users.
* User registration and authentication functionality.
* Ticket creation, categorization, and prioritization features.
* Automated ticket routing and assignment to support personnel.
* Escalation rules based on Service Level Agreements (SLAs).
* Real-time ticket status tracking and notifications for users.
* Admin and support team dashboards for ticket management.
* Reporting and analytics module for monitoring trends and performance.
* Role-based access control (users, agents, admins).
* Integration with email/SMS for notifications.
* Knowledge base integration for self-service.

**Out of Scope:**

* Integration with third-party CRM or ERP tools (unless defined as a future phase).
* Support for offline/desktop applications.
* Multilingual support in initial phase (unless specified later).
* Advanced AI-based chatbots (basic automation only).

**5. Assumptions**

* All users will have access to a computer or mobile device with an internet connection.
* Support teams will adhere to SLA policies as defined by the organization.

**6. Constraints:**

* The system must be developed and implemented within a 6-month timeline.
* The system should be scalable to handle up to 10,000 tickets per day without performance degradation.
* It must comply with applicable data privacy regulations (e.g., GDPR).

**7. Risk**

**1. Technical Risk**

Risk: Integration and compatibility issues with existing systems (CRM, email, chat, etc.) could lead to delays or functionality problems, causing disruptions in the ticket management process.

Mitigation: Conduct detailed technical assessments and integration testing to ensure compatibility with current systems. Allocate time for troubleshooting and ensure robust APIs for seamless data exchange.

**2. Political Risk:**

Risk: Internal organizational changes, such as shifts in key personnel or management priorities, could affect the project's support or direction, causing delays or shifting project goals.

Mitigation: Maintain regular communication with key stakeholders and senior leadership to ensure alignment. Create clear documentation to keep all parties informed, regardless of organizational changes.

**3. Requirement Risk:**

Risk: The requirements for the ticketing system might not be fully understood or documented, leading to misalignment between business needs and the delivered solution.

Mitigation: Engage stakeholders early in the project to define detailed requirements. Use iterative feedback and validation (e.g., user stories and prototypes) to refine the system according to actual needs.

**4. Business Risk:**

Risk: The new ticketing system might not achieve the expected improvements in customer satisfaction or operational efficiency, leading to a lack of return on investment (ROI).

Mitigation: Set clear, measurable business objectives before the project starts (e.g., reduced response time, SLA compliance). Regularly assess the system post- implementation and adjust processes as needed based on feedback and performance metrics.

**8. Business Process Overview**

**8.1. Legacy System (AS-IS)**

The current ticketing process is largely manual, involving several disconnected systems and processes that result in inefficiencies and delays. Below are the key elements of the legacy system:

Ticket Creation: Customers submit support tickets via email or phone, which are manually entered into the system by agents. This often leads to errors in ticket categorization and delays in assignment.

Ticket Assignment: Tickets are manually assigned to support agents based on availability or expertise. This process is time-consuming and lacks prioritization, leading to unequal workload distribution among agents.

SLA Management: SLA compliance is monitored manually through spreadsheets or ad hoc tracking, which is prone to human error. Tickets often exceed SLA timelines, leading to customer dissatisfaction.

Resolution & Closure: Agents resolve tickets based on available information, but often have limited access to knowledge resources, requiring them to solve recurring issues from scratch. The closure process is also manual and lacks consistency, leading to reopened tickets.

Reporting: Reporting is done manually through ad hoc data collection and spreadsheets, making it difficult to track key performance metrics (KPIs) like ticket resolution time, agent performance, and SLA adherence.

Knowledge Sharing: Information related to past issues and resolutions is stored across different systems, making it challenging for agents to quickly access relevant solutions.

**8.2. Proposed Recommendations (TO-BE)**

The proposed ticketing system aims to address the inefficiencies of the legacy system by automating and streamlining key processes. The following changes will improve the overall ticketing process:

Ticket Creation: The new system will allow customers to create tickets through multiple channels (email, web portal, chat, etc.). The system will automatically capture key details such as issue type, urgency, and customer information, eliminating manual data entry and reducing errors.

Ticket Assignment: The system will automatically categorize and prioritize tickets based on predefined rules (e.g., urgency, issue type). Tickets will be assigned to the most appropriate agent based on their expertise and availability, ensuring a more efficient workload distribution.

SLA Management: The new system will include automated SLA tracking, with real- time alerts and escalations for tickets nearing or exceeding their resolution deadlines. This will help ensure that tickets are resolved on time and SLAs are met.

Resolution & Closure: The system will integrate a knowledge base, allowing agents to quickly access solutions for common issues. Automated workflows will guide agents through the ticket resolution process, ensuring consistency and reducing resolution time. Tickets will be automatically closed once all resolution steps are completed, and customers are satisfied.

Reporting: The system will include built-in reporting features, providing real-time dashboards and detailed reports on KPIs such as ticket volume, resolution time, agent performance, and SLA compliance. These reports will be customizable, enabling managers to monitor performance and identify areas for improvement.

Knowledge Sharing: A centralized knowledge base will be integrated into the system, allowing agents to search for and contribute solutions to recurring issues. This will help reduce resolution times, improve consistency, and enable new agents to ramp up more quickly.

**Process Flow**



**Business Requirement**

|  |  |  |  |
| --- | --- | --- | --- |
| **Req ID** | **Requirement Name** | **Requirement Description** | **Priority** |
| BR001 | User Registration & Login | Allow users to register and log in securely to access the ticketing system. | High |
| BR002 | Raise New Ticket | Enable users to create new tickets with details such as issue type, description, and priority. | High |
| BR003 | Ticket Categorization | System should categorize tickets based on predefined issue types. | High |
| BR004 | Ticket Prioritization | Automatically assign priority levels to tickets based on severity and urgency. | High |
| BR005 | Automated Ticket Assignment | Assign tickets to support agents or teams automatically based on category and workload. | High |
| BR006 | Ticket Status Tracking | Users and agents should be able to view the real-time status of tickets. | High |
| BR007 | SLA Monitoring | Monitor time-bound SLAs for each ticket and trigger alerts if breached. | High |
| BR008 | Escalation Workflow | Automatically escalate tickets that are not resolved within SLA. | High |
| BR009 | Internal Comments & Updates | Agents should be able to log progress notes and internal updates. | Medium |
| BR010 | User Notifications | Send automated notifications to users for ticket creation, updates, resolution, and closure. | High |
| BR011 | Ticket History | Maintain a complete history of actions taken on each ticket. | Medium |
| BR012 | Dashboard for Users | Provide a dashboard for users to view, filter, and search their tickets. | Medium |
| BR013 | Dashboard for Agents/Admins | Provide dashboards for agents and admins with ticket queues, performance stats, etc. | High |
| BR014 | Reporting and Analytics | Generate reports on ticket volume, resolution time, SLA compliance, etc. | High |
| BR015 | Knowledge Base Integration | Allow users to access a knowledge base or FAQs before raising a ticket. | Medium |
| BR016 | Role-Based Access Control | Define different access levels for users, agents, and admins. | High |
| BR017 | Ticket Reopening | Allow users to reopen tickets if the issue is not resolved satisfactorily. | Medium |
| BR018 | Export & Download Reports | Allow admins to export analytics and ticket data for offline analysis. | Low |
| BR019 | Multi-Channel Support (Email/API) | Support ticket creation via email or API in addition to web UI. | Medium |
| BR020 | Data Security & Privacy | Ensure all user and ticket data is stored and transmitted securely (e.g., encrypted). | High |

**10. Appendices**

**10.1. List of Acronyms**

UAT-User Acceptance Testing

BRD- Business Requirement Document BR- Business Requirement

UI- User interference

UX- User experience

AI - Artificial Intelligence

GDPR - General Data Protection Regulation

UAT - User Acceptance Testing

D&I - Diversity and Inclusion

ROI - Return on Investment

AS-IS - Current State of the Process/System

TO-BE - Future State of the Process/System

KPI - Key Performance Indicator

TAT - Turnaround Time

SLA - Service Level Agreement

API - Application Programming Interface

**10.3. Related Documents**

• Functional Specifications

• Technical Design Document

• This Business Requirements Document (BRD) provides a comprehensive overview of the objectives, scope, requirements, and other relevant aspects of the Retail Store Management System (RSMS) project.

**SRS (Software Requirement Specification)**

**1. Introduction**

**1.1. Purpose**

The purpose of the Ticketing Life Cycle System is to streamline the process of issue reporting, tracking, and resolution within an organization. It provides users with a platform to create tickets for their concerns or inquiries, assigns these tickets to appropriate agents, and ensures timely updates on their progress. The system fosters effective communication between users and support teams, enhancing customer satisfaction while improving the efficiency of ticket management processes.

**1.2. Document Scope**

This document outlines the functional, non-functional, and system requirements for the development of Ticketing Life Cycle System. It provides detailed insights into user interactions, business rules, and constraints.

**1.3.** **Stakeholders**

* + - Business Analysts
    - Project Managers
    - Developers (Frontend, Backend, UI/UX)
    - Testers
    - Product Owners
    - SME’s

**1.4. Product Scope**

The Ticketing Life Cycle System is designed to cater to organizations of varying sizes, supporting multiple roles such as users, agents, and administrators.

Key functionalities include:

Ticket Creation and Management: Users can report issues, which are categorized and prioritized for resolution.

Agent Assignment and Resolution: Tickets are assigned to agents based on predefined rules and availability.

Role-Based Dashboards: Users, agents, and administrators have tailored views to manage their specific tasks efficiently.

Tracking and Notifications: The system keeps stakeholders informed through real-time updates and alerts.

Analytics and Reporting: Administrators can analyse trends, monitor performance, and generate reports to optimize operations.

The system supports scalability, security, and compliance with industry standards, making it suitable for technical support, customer service, and other business functions requiring issue resolution.

**2. Overview**

The Ticketing Life Cycle System is a web-based application offering a user-friendly interface accessible across devices. It incorporates modules for:

* **User Management:** Facilitates user registration, login, and profile management.
* **Ticket Management:** Covers the full ticketing workflow, including creation, assignment, status updates, and resolution.
* **Agent Management:** Allows administrators to assign roles, monitor workloads, and evaluate agent performance.
* **Notification System:** Ensures users and agents receive timely updates about ticket status and escalations.
* **Integration and Extensibility:** The system supports integration with third-party tools like Slack or Microsoft Teams and offers APIs for additional customization.

**3. System Architecture**

**Software Interfaces**

**Operating Systems:**

The system shall be compatible with Windows, macOS, and Linux for on-premises deployments and accessible on any OS via a browser for cloud-based deployments.

**Web Browsers:**

Supports modern web browsers like Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari (latest versions).

**Database Management System**

Utilizes relational databases such as MySQL, PostgreSQL, or cloud-based alternatives like AWS RDS or Azure SQL Database.

**Notification Services**

Integrates with email systems (e.g., SMTP) and SMS gateways (e.g., Twilio) for sending ticket status notifications.

**Hardware Interfaces**

User devices: Users and agents require devices like desktops, laptops, tablets, or smartphones with internet connectivity to access the system.

Network Infrastructure: Requires a reliable internet connection with a minimum bandwidth of 10 Mbps for smooth access and operation.

**4. Functional Requirement**

|  |  |  |  |
| --- | --- | --- | --- |
| **Req** **ID** | **Requirement** **Name** | **Requirement** **Description** | **Priority** |
| FR001 | User Registration | The system shall allow users to register by providing their name, email, and password. | High |
| FR002 | User Login | The system shall allow registered users to log in using their email and password. | High |
| FR003 | Ticket Creation | Users shall be able to create new tickets by entering a title, description, category, and priority. | High |
| FR004 | Ticket Assignment | The system shall automatically assign a ticket to an available agent based on the category. | High |
| FR005 | Ticket Status Update | Agents shall update the status of tickets to Open, In Progress, or Closed. | High |
| FR006 | Ticket Priority Update | The system shall allow users or agents to update the ticket's priority. | Medium |
| FR007 | View Ticket Details | Users and agents shall be able to view all ticket details, including status, category, and assigned agent. | High |
| FR008 | User Dashboard | Users shall have a dashboard displaying their open and | Medium |
|  |  | closed tickets. |  |
| FR009 | Agent Dashboard | Agents shall have a dashboard displaying assigned tickets with filters for status and priority. | Medium |
| FR010 | Ticket Search | Users and agents shall be able to search for tickets using keywords or filters like status and priority. | High |
| FR011 | Add Ticket Comments | Users and agents shall add comments to tickets for better collaboration. | Medium |
| FR012 | Email Notifications | The system shall send email notifications for ticket updates, such as status changes or new comments. | Medium |
| FR013 | Auto-assign Ticket to Agent | The system shall use predefined rules to assign tickets automatically to agents based on their availability and category. | High |
| FR014 | Ticket Escalation | Tickets not resolved within a specific timeframe shall be automatically escalated to a higher authority. | Medium |
| FR015 | Role-Based Access Control | The system shall provide role-based access control, restricting features for users, agents, and admins. | Medium |
| FR016 | View Ticket History | Users and agents shall view the history of changes made to a ticket, including status and priority updates. | High |
| FR017 | Add Attachments to Tickets | Users and agents shall attach files to tickets for additional context or support. | Medium |
| FR018 | View Agent Performance | Admins shall view performance metrics for agents, such as the number of resolved tickets. | Medium |
| FR019 | Define Ticket Categories | Admins shall create and manage ticket categories, such as Technical or Billing. | Low |
| FR020 | Filter Tickets | Users and agents shall filter tickets by status, priority, or category in their dashboards. | Medium |
| FR021 | SLA  Configuration | The system shall allow admins to configure Service Level Agreements (SLAs) for ticket resolution. | Medium |
| FR022 | Audit Trail | The system shall maintain an audit trail of all ticket updates for compliance and troubleshooting. | Medium |
| FR023 | Mobile-Friendly Interface | The system shall provide a mobile-friendly interface for creating and managing tickets. | High |
| FR024 | Priority-Based Alerts | The system shall notify agents about high-priority tickets through pop-up alerts or email. | Medium |
| FR025 | Auto-Status Transition | The system shall automatically transition a ticket's status to "In Progress" when an agent starts working on it. | Medium |
| FR026 | Mobile-Friendly Interface | The system shall provide a mobile-friendly interface for creating and managing tickets. | Medium |
| FR027 | Export Ticket Data | Users, agents, and admins shall export ticket data in CSV or Excel format. | Low |
| FR028 | Multi-Language Support | The system shall support multiple languages for users in different regions. | Low |
| FR029 | Customize Ticket Fields | Admins shall customize ticket fields, adding new ones if required. | Low |
| FR030 | Agent | Admins shall reassign tickets from one agent to another. | Medium |
|  | Reassignment |  |  |
| FR031 | Ticket Merging | The system shall allow agents to merge duplicate tickets. | Medium |
| FR032 | Report Generation | Admins shall generate reports on ticket trends, resolution times, and category-wise breakdowns. | Medium |
| FR033 | Feedback Collection | Users shall provide feedback on ticket resolution. | Medium |
| FR034 | Archive Closed Tickets | The system shall archive closed tickets after a specified period. | Low |
| FR035 | Integration with Third-Party Tools | The system shall integrate with third-party tools like Slack or Microsoft Teams for ticket updates. | Low |
| FR036 | Ticket Duplication Check | The system shall check for duplicate tickets based on title and description. | Medium |
| FR037 | Visual Ticket Status Indicators | The system shall provide visual indicators (e.g., color codes) for ticket status and priority. | Low |
| FR-038 | SLA Violation Alerts | The system shall alert agents and admins when a ticket is at risk of breaching SLA deadlines. | Medium |
| FR039 | Delete User Account | Users shall delete their accounts and associated data, adhering to data protection regulations. | Low |
| FR040 | Accessibility Compliance | The system shall comply with accessibility standards like WCAG 2.1 for users with disabilities. | High |

**5. Non-Functional Requirement**

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| **Req** **ID** | **Requirement** **Name** | **Requirement** **Description** |
| NFR001 | System Availability | The system shall maintain an uptime of 99.9% to ensure uninterrupted access to users and agents. |
| NFR002 | Performance | The system shall handle up to 1,000 concurrent users without degradation in performance. |
| NFR003 | Scalability | The system shall scale horizontally to accommodate up to 10,000 users and 50,000 tickets per month. |
| NFR004 | Security | The system shall comply with industry security standards, such as OWASP guidelines, to prevent unauthorized access. |
| NFR005 | Data Encryption | All sensitive data, including passwords and ticket information, shall be encrypted at rest and in transit. |
| NFR006 | Response Time | The system shall provide responses to user actions, such as ticket creation, within 2 seconds under normal load. |
| NFR007 | Browser Compatibility | The system shall support all major browsers, including Chrome, Firefox, Safari, and Edge. |
| NFR008 | Mobile Compatibility | The system shall provide a responsive design for seamless operation on mobile devices. |
| NFR009 | Accessibility Compliance | The system shall adhere to WCAG 2.1 Level AA standards to ensure accessibility for users with disabilities. |
| NFR010 | Maintainability | The system shall allow developers to update or extend features |

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|  |  | with minimal impact on existing functionality. |
| NFR011 | Backup and Recovery | The system shall perform daily backups and provide data recovery within 2 hours in case of failure. |
| NFR012 | Logging and Monitoring | The system shall log all critical events and provide real-time monitoring for troubleshooting and performance analysis. |
| NFR013 | Usability | The system shall provide an intuitive user interface, requiring no more than 30 minutes of training for basic operations. |
| NFR014 | Localization | The system shall support localization for at least 5 languages, including English, Spanish, French, German, and Chinese. |
| NFR015 | Data Retention | Closed tickets and related data shall be retained for a minimum of 5 years. |
| NFR016 | Integration | The system shall integrate with third-party tools such as Slack, Microsoft Teams, and email systems. |
| NFR017 | Fault Tolerance | The system shall automatically recover from a single point of failure within 30 seconds. |
| NFR018 | Auditability | All user and system actions shall be auditable for compliance and troubleshooting purposes. |
| NFR019 | Cost Efficiency | The system shall operate within an annual maintenance budget of $50,000. |
| NFR020 | API Response Time | The system's APIs shall respond to requests within 500 milliseconds under normal load. |

**6. Use Case Specifications**

**Use Case 1:** Raise a New Ticket

**1. Use Case Name:** Raise a New Ticket

**2. Description:** A user creates a ticket to report an issue, provide details, and request assistance.

**3. Actors:**

**•** Primary: End-User

• Secondary: System

**4. Basic Flow:**

1. User logs into the ticketing system.

2. User navigates to the "Raise a Ticket" section.

3. User selects the issue type.

4. User provides a detailed description of the issue.

5. User attaches files, if necessary.

6. User sets the ticket priority.

7. User submits the ticket.

8. System generates a unique ticket ID and confirms submission.

**5. Alternate Flow:**

1. User saves the ticket as a draft instead of submitting it.

2. System stores the ticket as a draft for later editing.

**6. Exceptional Flow:**

a) Required fields are incomplete:

1. System highlights missing fields and prevents submission.

b) File exceeds the allowed size limit:

1. System displays an error and prevents file upload.

**7.Pre-Conditions:**

User must have an active account.

**8. Post-Conditions:**

**•** Ticket is logged in the system and assigned a unique ID.

• Notification is sent to the user.

**9. Assumptions:**

**•** Users know how to navigate the ticketing system interface.

**10.Constraints:**

**•** Attachments must not exceed 5MB per file.

• Submission allowed only during system operational hours.

**11.Dependencies:**

**•** Database and notification systems must be operational.

**12.Inputs and Outputs:**

• Inputs: Issue type, description, priority, optional attachments.

• Outputs: Ticket ID, confirmation notification.

**13.Business Rules:**

• Tickets must include all mandatory fields before submission.

• Duplicate tickets should be flagged.

**14.Miscellaneous Information:**

• Interface should support mobile and desktop views.

**Use** **Case** **2:** **View** **Ticket** **Details**

1. **Use** **Case** **Name:**

View Ticket Details

1. **Description:**

A user views the details of a previously submitted ticket.

1. **Actors:**
   * **Primary:** End-User
   * **Secondary:** System
2. **Basic** **Flow:**
3. User logs into the system.
4. User navigates to "My Tickets."
5. User selects a ticket to view.
6. System displays ticket details: ID, issue type, description, status, and history.
7. **Alternate** **Flow:**
   * If the ticket is closed:
   * System displays resolution details.
8. **Exceptional** **Flow:**
   * Ticket is not accessible:
   * System displays "Ticket not found" error.
9. **Pre-Conditions:**
   * User must have access rights to the ticket.
10. **Post-Conditions:**

Ticket details are displayed to the user.

**9. Assumptions:**

* System’s database is up-to-date.

**10. Constraints:**

* + Users can view only their own tickets.

**11. Dependencies:**

* + Database must store ticket details accurately.

**12. Inputs** **and** **Outputs:**

* + **Inputs:** Ticket ID or selection from list.
  + **Outputs:** Detailed ticket information.

**13. Business** **Rules:**

* + Closed tickets should display resolution summaries.

**14. Miscellaneous** **Information:**

* + Interface may limit details for mobile views.

**Use** **Case** **3:** **Edit** **Draft** **Ticket**

1. **Use** **Case** **Name:**

Edit Draft Ticket

1. **Description:**

User updates the details of a saved draft ticket.

1. **Actors:**
   * **Primary:** End-User
   * **Secondary:** System
2. **Basic** **Flow:**
3. User logs into the system.
4. User navigates to the "My Drafts" section.
5. User selects a draft ticket.
6. User updates field and saves changes or submits the ticket.
7. **Alternate** **Flow:**

If the user decides not to submit the ticket: User saves changes and exits without submitting.

1. **Exceptional** **Flow:**
   * Draft is not found: System displays "Draft not found" error.
2. **Pre-Conditions:**
   * A draft ticket must exist in the system.
3. **Post-Conditions:**
   * Draft is updated, or ticket is submitted.
4. **Assumptions:**
   * User has edit rights for the draft.
5. **Constraints:**
   * Drafts expire after 30 days.
6. **Dependencies:**
   * Drafts must be stored in the system.
7. **Inputs** **and** **Outputs:**
   * **Inputs:** Updated ticket details.
   * **Outputs:** Updated draft or new ticket ID.
8. **Business** **Rules:**
   * Mandatory fields must be completed for submission.
9. **Miscellaneous** **Information:**
   * Drafts support multiple edits before submission.

**Use case 4**

1. **Use** **Case** **Name:**

Delete Draft Ticket

1. **Description:**

User deletes a saved draft ticket they no longer wish to submit.

1. **Actors:**
   * **Primary:** End-User
   * **Secondary:** System
2. **Basic** **Flow:**
3. User logs into the system.
4. User navigates to the "My Drafts" section.
5. User selects a draft ticket.
6. User chooses the "Delete" option.
7. System confirms deletion.
8. **Alternate** **Flow:**
   * **5a.** If the user cancels the deletion:
     + Draft remains in the system.
9. **Exceptional** **Flow:**
   * Draft not found:
     + System displays "Draft not found" error.
10. **Pre-Conditions:**
    * Draft ticket exists in the system.
11. **Post-Conditions:**
    * Draft is removed from the system.
12. **Assumptions:**
    * User has the right to delete drafts.
13. **Constraints:**
    * Drafts cannot be recovered after deletion.
14. **Dependencies:**
    * Draft tickets must be stored in the system.
15. **Inputs** **and** **Outputs:**
    * **Inputs:** Draft ticket ID.
    * **Outputs:** Deletion confirmation.
16. **Business** **Rules:**
    * Only the ticket owner can delete their draft.
17. **Miscellaneous** **Information:**
    * Deletion requires user confirmation.

**Use** **Case** **5:** **Submit** **Feedback** **for** **a** **Resolved** **Ticket**

1. **Use** **Case** **Name:**

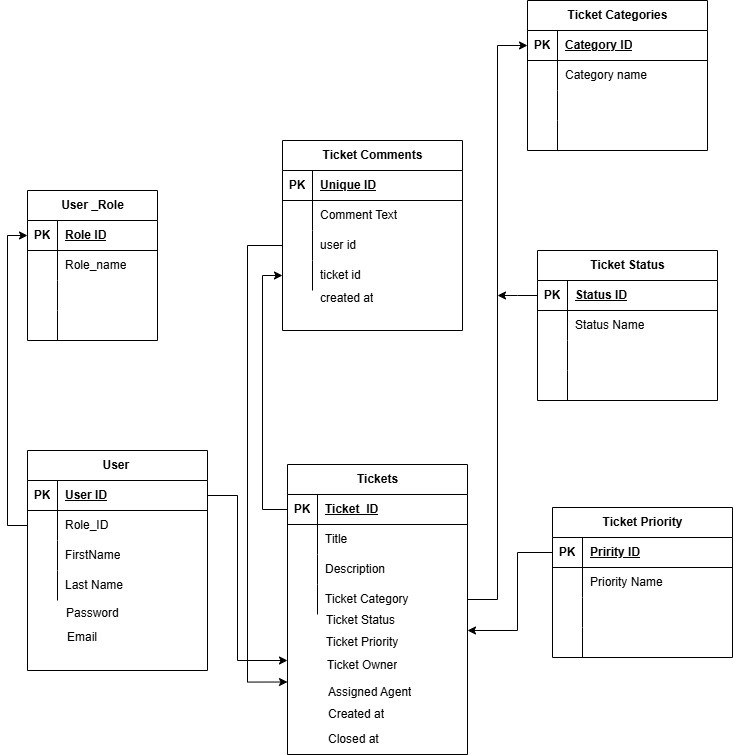
Submit Feedback for a Resolved Ticket

1. **Description:**

A user provides feedback on the resolution of a ticket.

1. **Actors:**
   * **Primary:** End-User
   * **Secondary:** System
2. **Basic** **Flow:**
3. User logs into the system.
4. User navigates to "Resolved Tickets."
5. User selects a ticket.
6. System displays the resolution details.
7. User submits feedback, including ratings and optional comments.
8. System saves the feedback and updates the ticket record.
9. **Alternate** **Flow:**
   * User opts to skip providing feedback.
10. **Exceptional** **Flow:**
    * Feedback submission fails due to system error:
    * System notifies the user and prompts them to retry later.
11. **Pre-Conditions:**
    * Ticket must have a "Resolved" status.
12. **Post-Conditions:**
    * Feedback is successfully recorded in the system.
13. **Assumptions:**
    * User understands how to provide feedback.
14. **Constraints:**
    * Feedback must be submitted within 30 days of ticket resolution.
15. **Dependencies:**
    * Ticket details and resolution history must be accessible.
16. **Inputs** **and** **Outputs:**
    * **Inputs:** Rating, comments.
    * **Outputs:** Confirmation of feedback submission.
17. **Business** **Rules:**
    * Users can submit feedback only once per ticket.
18. **Miscellaneous** **Information:**
    * Feedback may influence team performance metrics.

**3. Make** **an** **ERD** **of** **creating** **a** **Ticketing** **life** **cycle.**

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**4. User Stories (Online Fertilizer Store Application):**

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| --- | --- | --- | --- |
| **User** **Story** **No:** 1 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to create an account so that I can place orders. | | | |
| **BV:** 500 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can register with email, phone, and password. Users receive an OTP for verification.  Users get a confirmation email upon successful registration. | | | |

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| **User** **Story** **No:** 2 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to browse fertilizers by category so that I can find suitable products | | | |
| **BV:** 200 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can view product categories.  Users can apply filters (brand, price, type).  Users can search by keyword. | | | |

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| **User** **Story** **No:** 3 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to view product details so that I can make an informed purchase | | | |
| **BV:** 500 | | **CP:** **3** | |
| **Acceptance** **Criteria:**  Users see product images, descriptions, specifications, and price. Users can check stock availability.  Users can view customer ratings and reviews. | | | |

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| **User** **Story** **No:** 4 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to add products to the cart so that I can purchase them later. | | | |
| **BV:** 100 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can add products to the cart. Users can remove or update quantities.  Users see a summary of items before checkout. | | | |

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| **User** **Story** **No:** 5 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to checkout securely so that I can place an order. | | | |
| **BV:** 200 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can enter a shipping address.  Users can select a payment method. | | | |

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| **User** **Story** **No:** 6 | **Task:** 2 | | **Priority:** Medium |
| As a customer, I want to track my order so that I know the delivery status. | | | |
| **BV:** 100 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can view the real-time order status. Users get tracking details via email/SMS.  Users receive notifications for shipment updates. | | | |

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| **User** **Story** **No:** 7 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to receive order confirmation and updates via email/SMS. | | | |
| **BV:** 500 | | **CP:** **5** | |
| **Acceptance** **Criteria:**  Users receive order confirmation via email/SMS. Users get notifications for shipment and delivery.  Users can opt out of SMS/email notifications. | | | |

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| **User** **Story** **No:** 8 | **Task:** 2 | | **Priority:** MEDIUM |
| As an admin, I want to manage customer inquiries so that I can provide support. | | | |
| **BV:** 50 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Admins can view and respond to customer queries. Admins can categorize queries by type.  Customers receive replies via email/SMS. | | | |

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| **User** **Story** **No:** 9 | **Task:** 2 | | **Priority:** MEDIUM |
| As an admin, I want to generate sales reports so that I can analyze performance. | | | |
| **BV:** 100 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Admins can generate reports for sales, revenue, and top-selling products. Reports can be exported in CSV/PDF format.  Reports can be filtered by date range. | | | |

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| **User** **Story** **No:** 10 | **Task:** 2 | | **Priority:** MEDIUM |
| As a logistics partner, I want to receive order shipping details so that I can schedule  deliveries. | | | |
| **BV:** 200 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Logistics partners receive order details via the system. They can access customer addresses and contact details.  Delivery agents can mark orders as dispatched. | | | |

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| **User** **Story** **No:** 11 | **Task:** 2 | | **Priority:** MEDIUM |
| As a customer, I want to select my preferred delivery date so that I can receive orders conveniently. | | | |
| **BV:** 500 | | **CP:** **1** | |
| **Acceptance** **Criteria:**  Users can choose available delivery slots. Only valid delivery dates are shown.  Users get a confirmation email with the selected date.. | | | |

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| **User** **Story** **No:** 12 | **Task:** 2 | | **Priority:** HIGH |
| As an admin, I want to manage user roles so that I can control platform access. | | | |
| **BV:** 500 | | **CP:** **3** | |
| **Acceptance** **Criteria:**  Admins can assign roles (Customer, Manager, Delivery Partner). Different roles have different access levels.  Unauthorized users cannot access restricted features. | | | |

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| **User** **Story** **No:** 13 | **Task:** 2 | | **Priority:** HIGH |
| As a customer, I want to pay via multiple payment options so that I can use my preferred  method. | | | |
| **BV:** 500 | | **CP:** **5** | |
| **Acceptance** **Criteria:**  Payment options include credit/debit cards, UPI, net banking. Payments are processed securely via a payment gateway.  Users receive an invoice after successful payment. | | | |

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| **User** **Story** **No:** 14 | **Task:** 2 | | **Priority:** LOW |
| As a customer, I want to subscribe to newsletters so that I receive offers and updates | | | |
| **BV:** 100 | | **CP:** **3** | |
| **Acceptance** **Criteria:**  Users can enter their email to subscribe.  Users receive periodic newsletters about offers and new products.  Users can unsubscribe at any time. | | | |

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| **User** **Story** **No:** 15 | **Task:** 2 | | **Priority:** LOW |
| As an admin, I want to manage blog content so that I can share agricultural tips. | | | |
| **BV:** 100 | | **CP:** **2** | |
| **Acceptance** **Criteria:**  Admins can create, edit, publish, and delete blog posts. Blogs can include images and videos.  Blogs appear in a dedicated section of the website. | | | |