**Testing**

**Testing Strategy:**

**Unit Testing:** During testing, individual modules were tested to ensure they function correctly and met requirements before being integrated. For example, the inventory addition module was tested to verify its accuracy in recording stock, updating inventory, and sending notifications. This testing helped ensure each module was reliable.

**Integration Testing:** Next, the interaction between system modules was tested to ensure they worked together seamlessly. For example, the transaction and reporting modules were tested to confirm inventory changes, like sales or additions, were reflected in reports. This phase focused on ensuring data integrity and system reliability during complex processes.

**User Acceptance Testing (UAT):** Finally, end-users tested the system in a real-world setting to evaluate its usability and performance. Feedback was gathered from laboratory staff and administrators on the system’s interface, responsiveness, and functionality. Adjustments were made based on their input to improve the system and meet user needs effectively.

**Test Cases:**

The following table outlines the test cases performed to verify the functionality of the system according to the specified functional requirements. Each test case is designed to validate key features such as user authentication, inventory management, order processing, reporting, system performance, and scalability. These test cases ensure that the system operates as expected, meets user needs, and provides a reliable and efficient solution across various modules and functionalities.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Test Case** | **Test Case Description** | **Expected Result** | **Pass/Fail** |
| TC-01 | Login System | Test secure login with valid username and password. | User successfully logs in. | Pass |
| TC-02 | Login System | Test login with invalid username and/or password. | User is denied access with an error message. | Pass |
| TC-03 | Access Control | Test different user roles (admin, sales staff, inventory managers) accessing restricted areas. | Users only access areas according to their roles. | Pass |
| TC-04 | Product List and Categories | Test adding, updating, and deleting products with name, description, price, and quantity. | Product is added, updated, or deleted successfully. | Pass |
| TC-05 | Real-Time Inventory Tracking | Test inventory levels update after each sale. | Inventory levels decrease after each sale. | Pass |
| TC-06 | Stock Adjustment | Test manual stock adjustments by admin. | Stock levels adjust as per the entered value. | Pass |
| TC-07 | Order Entry | est capturing customer details (name, contact info), product purchased, quantity, price, and date of purchase. | Order is recorded with accurate details. | Pass |
| TC-08 | Order Processing | Test tracking of order status (pending, completed, canceled). | Order status updates correctly based on transaction. | Pass |
| TC-09 | Sales Recording and Reports | Test automatic recording of sales in the database. | Sale is recorded in the database after each transaction. | Pass |
| TC-10 | Product Performance Reports | Test generation of performance reports for individual products. | Report accurately reflects product performance. | Pass |
| TC-11 | Sales Trends and Profit Analysis | Test generation of profit analysis reports by comparing sales data and inventory costs. | Report accurately calculates profit margins. | Pass |
| TC-12 | Inventory Reports | Test generation of real-time inventory reports showing current stock levels. | Report displays up-to-date stock levels. | Pass |
| TC-13 | Customer Profile Management | Test storing and managing customer profiles with name, contact number, email, and order history. | Customer profile is created, updated, and stored. | Pass |
| TC-14 | Order History | Test viewing past orders and tracking order statuses. | Past orders and their statuses are displayed correctly. | Pass |
| TC-15 | Order Cancellation and Refunds | Test order cancellation within allowed timeframe and request for refund. | Order is canceled and refund is processed if applicable. | Pass |
| TC-16 | Notifications | Test notifications for order confirmations, stock updates, and low inventory warnings. | Users receive timely notifications as expected. | Pass |
| TC-17 | Dashboard | Test dashboard overview for admins and managers showing sales, inventory, and customer activity. | Dashboard displays correct and updated data. | Pass |
| TC-18 | Search and Filters | Test search functionality for products, orders, or customers. | Relevant search results are displayed based on input. | Pass |
| TC-19 | Responsive Design | Test system responsiveness across desktops, tablets, and smartphones. | Interface adjusts properly to various screen sizes. | Pass |
| TC-20 | Payment Gateway Integration | Test integration with payment gateway to process online payments. | Payment is processed successfully through the gateway. | Pass |
| TC-21 | External System Integration | Test integration with external systems (e.g., accounting software, e-commerce platforms). | External systems sync data correctly. | Pass |
| TC-22 | Data Backup | Test automatic data backup process at regular intervals. | Data is backed up as scheduled without errors. | Pass |
| TC-23 | Data Recovery | Test data recovery mechanism after system failure or data corruption. | Data is restored correctly without loss. | Pass |
| TC-24 | User Management | Test creation, modification, and deletion of user accounts by admin. | User accounts are created, modified, and deleted as expected. | Pass |
| TC-25 | Audit Logs | Test audit trail to ensure all user actions (login attempts, data modifications, transactions) are logged. | All actions are accurately logged in the audit trail. | Pass |
| TC-26 | System Performance | Test system's ability to handle a high number of transactions without performance degradation. | System operates without lag or downtime during high traffic. | Pass |
| TC-27 | Scalability | Test system scalability by adding new products, increasing order volumes, and adding users. | System performs smoothly as it scales up. | Pass |

**Testing Tools:**

For testing, the proponents employed manual testing to thoroughly evaluate the system's functionality. This approach allowed for in-depth examination of each feature, ensuring all requirements were met and the application performed as expected. By manually interacting with the application, I was able to identify issues that automated tests might have missed, providing a comprehensive validation of the system.

**Bug Tracking**:

To manage and track any bugs discovered during testing, the proponents utilized Taiga as the primary bug-tracking tool. Taiga offered an organized platform for logging, prioritizing, and monitoring issues. Each bug was documented with relevant details, making it easy to track its progress and ensure timely resolutions. This streamlined the bug-fixing process and ensured transparency throughout the development cycle.

**Deployment**

**Deployment Steps:**

The software is deployed through a multi-step process that involves setting up the necessary environments and configuring servers or cloud services. The deployment process begins with the preparation of the production environment, including the configuration of servers or cloud instances. Once the environment is set up, the application is deployed and configured to run seamlessly on the designated platform.

**Continuous Integration/Continuous Deployment (CI/CD):**

To streamline the development process, automated CI/CD pipelines are used for building, testing, and deploying the software. The CI/CD process ensures that code changes are automatically tested and deployed to staging environments, reducing the chances of errors in production. This allows for faster iterations and quicker feedback, enhancing the overall development workflow.

**Environment Setup:**

Setting up the development, staging, and production environments involves several steps. The development environment is configured with the necessary tools, dependencies, and access to local services. The staging environment mirrors production to ensure that tests are conducted in a production-like setting. The production environment is carefully configured for optimal performance and security, ensuring that the software runs smoothly for end users.

**Maintenance and Future Work**

**Ongoing Maintenance:**

The software will undergo continuous maintenance through regular updates, bug fixes, and performance optimizations. Monitoring tools will be implemented to track system health and identify potential issues. As part of the maintenance process, security patches will be applied, and any identified vulnerabilities will be addressed promptly to ensure the software remains secure and reliable.

**Known Issues:**

There are several known limitations and bugs that still require attention. These include:

* Online Payments
  + Not an online transaction
  + No credit card transaction
* Back Up and Security
  + Back up is not online

These issues are tracked and will be prioritized for resolution in upcoming versions, ensuring that they are addressed as part of the ongoing maintenance efforts.

**Future Enhancements:**

Future versions of the software may include a range of improvements and new features. Potential enhancements include

* Barcode and QR Scanner
* Integration with AI

which will aim to improve user experience, performance, and scalability. These enhancements will be evaluated and implemented based on user feedback and evolving needs.

**User Manual**

**Installation Instructions:**

Since the application is accessible online, there is no need for a local installation. To begin using the software, follow these simple steps:

1. Open a web browser (e.g., Chrome, Firefox, Safari).
2. In the address bar, enter the provided URL (e.g., https://www.example.com).
3. If required, sign in with your credentials or create a new account.
4. Once logged in, you can start using the application directly from your browser. No installation or setup is needed on your local machine.

**User Guide:**

Once you have accessed the application online, follow this guide to navigate and use the software effectively:

1. **Dashboard Overview:**  
   After logging in, you will land on the main dashboard. Here, you'll find an overview of your tasks, recent activities, and important notifications.
2. **Navigating the Application:**
   * **Menu Bar:** On the left-hand side, you will find a menu bar with options like "Home," "Settings," "Reports," and "Profile."
   * **Sections:** Click on any section to explore its features, such as viewing reports, updating settings, or managing your account.
3. **Using Key Features:**
   * **Feature 1:** To use the main feature, click on the “Feature 1” option from the menu. This allows you to [describe the action performed, e.g., create a report, submit a request, etc.].
   * **Feature 2:** To access additional tools, navigate to the “Feature 2” section. Here, you can [describe the action performed, e.g., manage user settings, track activity, etc.].
4. **Help and Support:**  
   If you encounter any issues, click on the “Help” button in the top-right corner for troubleshooting tips, or reach out to customer support via the live chat feature.

**Conclusion**

The proposed Sales and Inventory Management System for Bakey Flakey addresses the key challenges of manual sales tracking and inventory monitoring, offering a more efficient and reliable solution. By automating sales transactions and real-time inventory updates, the system improves accuracy, reduces the risk of errors, and enhances operational efficiency. The integration of security features, organized inventory management, and sales monitoring will provide the business with the tools necessary to streamline operations, improve decision-making, and ensure customer satisfaction.

With continuous maintenance and future enhancements planned, such as the integration of barcode scanning and AI, the system is designed to evolve with the business needs. The software's user-friendly interface and online accessibility further ensure that it can scale with the company's growth. As a result, Bakey Flakey will benefit from greater control over its sales and inventory, allowing for more efficient operations and ultimately contributing to its success and sustainability in the competitive food industry.