
Software Test Plan

for

CropCare: A Platform for Sustainable Farming in Bangladesh

Version 1.0 approved

Prepared by Mohammad Shuvo Ali

AIUB

11 August 2023

Table of Contents

Revision History	2
1. TEST PLAN IDENTIFIER: CCP-TP-001	3
2. REFERENCES.....	3
3. INTRODUCTION.....	3
Background to the Problem.....	3
Solution to the Problem.....	4
4. REQUIREMENT SPECIFICATION	4
4.1 System Features	4
4.2 System Quality Attributes	7
4.3 System Interface.....	9
4.4 Project Requirements	10
5. FEATURES NOT TO BE TESTED.....	11
6. TESTING APPROACH.....	12
6.1 Testing Levels.....	12
6.2 Test Tools.....	13
6.3 Meetings.....	14
7. TEST CASES/TEST ITEMS	15
8. ITEM PASS/FAIL CRITERIA	20
9. TEST DELIVERABLES	21
10. STAFFING AND TRAINING NEEDS.....	21
11. RESPONSIBILITIES.....	22
12. TESTING SCHEDULE.....	22
13. PLANNING RISKS AND CONTINGENCIES	23
14. APPROVALS.....	23

Revision History

[illegible]

1. TEST PLAN IDENTIFIER: CCP-TP-001

2. REFERENCES

- [1] Bangladesh Bureau of Statistics, "Agriculture," Statistical Yearbook of Bangladesh 2020, 2020.
- [2] M. S. Hossain, "Challenges of Agricultural Extension Service in Bangladesh: A Study Based on Selected Sub-districts," IOSR Journal of Agriculture and Veterinary Science, vol. 10, no. 3, pp. 55-61, 2017.
- [3] Bangladesh Telecommunication Regulatory Commission, "Internet Subscribers in Bangladesh," Internet Subscribers in Bangladesh, 2022. [Online]. Available: <https://www.btrc.gov.bd/internet-subscribers-bangladesh>. [Accessed: August 12, 2023].
- [4] A. Rahman, M. Moniruzzaman, and R. L. Mandelbaum, "Impact of Environmental Factors on Agricultural Productivity in Bangladesh: A Review," Cogent Environmental Science, vol. 6, no. 1, 2020.
- [5] A. S. Islam and A. U. Bhuyan, "Agricultural Extension Services in Bangladesh: An Overview," American Journal of Rural Development, vol. 2, no. 1, pp. 6-10, 2014.
- [6] S. Ahmed, M. A. Islam, and M. A. R. Sarkar, "Information and Communication Technologies (ICT) Adoption by the Farmers in Bangladesh: An Empirical Study," International Journal of Research in Business and Social Science, vol. 8, no. 1, pp. 98-110, 2019.

3. INTRODUCTION

Background to the Problem

In Bangladesh, agriculture serves as the backbone of the economy, employing a significant portion of the population and contributing significantly to the nation's GDP. However, this vital sector faces numerous challenges that impede productivity, sustainability, and profitability. Farmers often lack access to modern and effective agricultural practices, timely information, and resources necessary to optimize crop yields and manage their farms efficiently.

The root cause of this problem lies in the lack of accessible and comprehensive platforms that bridge the gap between traditional farming methods and modern technology. Farmers have difficulty accessing real-time information tailored to their specific contexts, which hampers their ability to make informed decisions about planting, fertilizing, pest management, and weather-related challenges. As a result, crop yields can be suboptimal, leading to financial instability for farmers and food security concerns for the nation.

Solution to the Problem

The proposed solution, CropCare, addresses these challenges by providing a robust and user-friendly mobile platform and web-based dashboard. This solution is particularly appropriate because it leverages the widespread adoption of smartphones and the internet across Bangladesh. The mobile application empowers farmers by offering personalized recommendations based on their location, soil type, and crop type. Real-time weather alerts and pest advisories further enable them to make informed decisions. The marketplace function facilitates the buying and selling of agricultural inputs, boosting access to resources.

For agricultural experts and administrators, the web-based dashboard offers real-time insights into crop performance, soil health, and weather patterns. This empowers experts to provide personalized recommendations, enhancing overall agricultural practices. The platform's scalability ensures that a large number of users can benefit, leading to a positive impact on the agricultural landscape of Bangladesh.

Software Description and Purpose:

CropCare is a mobile platform designed to provide sustainable farming practices and crop management tools to farmers in Bangladesh. The mobile application offers functionalities such as personalized crop management guidance, real-time weather and pest alerts, a marketplace for agricultural inputs, and a knowledge-sharing community. The web-based dashboard caters to agricultural experts and administrators, offering them real-time data for informed decision-making and content management capabilities.

Existing Studies in the Problem Area:

While there are some agricultural extension services and advisory systems in Bangladesh, they often lack user-friendly interfaces, real-time data integration, and personalized recommendations. Some existing applications offer limited functionalities, but they fall short in providing a holistic solution that addresses the diverse needs of farmers and experts. CropCare aims to stand out by combining essential features in one platform, enhancing user experience, and contributing to the modernization and sustainability of the agricultural sector in Bangladesh.

4. REQUIREMENT SPECIFICATION

4.1 System Features

1. System Login:

- 1.1. The system shall provide a login screen for users to enter their username and password.
- 1.2. The system shall validate the user's credentials against the user database.
- 1.3. The system shall allow access to authorized users only.
- 1.4. The system shall provide a way for users to reset their password if forgotten.

1.5. The system shall display an error message if an incorrect username or password is entered.

Priority Level: High

Precondition: User account information is available in the system

Cross-references: N/A

2. Crop Identification

2.1. The system shall use image recognition technology to identify different types of crops planted in a farm.

2.2. The identified crops shall be categorized and displayed on the user interface.

2.3. The system shall have a high accuracy rate of at least 90% in identifying crops.

2.4. The system shall provide additional information on each identified crop, such as growth stage, estimated time of maturity, and recommended harvesting time.

Priority Level: High

Precondition: Images of the crops are available in the system

Cross-references: N/A

3. Soil Analysis

3.1. The system shall analyze soil samples taken from the farm to determine the type and number of fertilizers and other soil additives needed.

3.2. The analysis shall provide recommendations based on the type of crop to be planted, soil pH, nutrient content, and other relevant factors.

3.3. The system shall display the soil analysis results and recommendations on the user interface.

3.4. The system shall update the soil analysis data regularly to ensure accurate recommendations.

Priority Level: High

Precondition: Soil samples are taken and uploaded to the system

Cross-references: 2.1, 4.1, 7.2

4. Pest and Disease Management

4.1. The system shall provide recommendations on the most effective pest and disease management strategies based on crop type, location, and weather conditions.

4.2. The recommendations shall be based on data collected from sensors, satellite imagery, and other sources.

4.3. The system shall display the recommendations on the user interface.

4.4. The system shall provide alerts to the user when pest and disease outbreaks are detected.

Priority Level: High

Precondition: Data collected from sensors and other sources are available in the system

Cross-references: 2.1, 3.1, 5.1

5. Irrigation Management

- 5.1. The system shall monitor soil moisture levels and provide recommendations on the appropriate time and amount of irrigation needed for optimal crop growth.
- 5.2. The recommendations shall be based on crop type, soil type, weather conditions, and other relevant factors.
- 5.3. The system shall display the irrigation recommendations on the user interface.
- 5.4. The system shall provide alerts to the user when soil moisture levels are too low or too high.

Priority Level: High

Precondition: Data collected from soil moisture sensors are available in the system

Cross-references: 2.1, 4.1

6. Harvest Planning

- 6.1. The system shall provide recommendations on the most optimal time to harvest crops based on weather, soil, and crop conditions.
- 6.2. The recommendations shall be based on crop maturity, market demand, and other relevant factors.
- 6.3. The system shall display the harvest recommendations on the user interface.
- 6.4. The system shall provide alerts to the user when the recommended harvest time approaches.

Priority Level: Medium

Precondition: Crop data and market demand data are available in the system

Cross-references: 2.1, 5.1, 7.2

7. Inventory Management

- 7.1. The system shall track the amount and type of seeds, fertilizers, pesticides, and other supplies used in the farm.
- 7.2. The system shall provide alerts when inventory levels fall below specified thresholds.
- 7.3. The system shall display the inventory data on the user interface.
- 7.4. The system shall allow the user to order supplies through the system.

Priority Level: Medium

Precondition: Inventory data is available in the system

Cross-references: 3.1, 4.1

8. System Logout:

- 8.1. The system shall provide a logout button or link for users to log out of the system.
- 8.2. The system shall clear the user's session and remove any saved login credentials.
- 8.3. The system shall redirect the user to the login screen after logout.

Priority Level: Medium

Precondition: User is currently logged into the system

Cross-references: N/A

9. Manage Content

9.1. The system shall provide access to administrators to view, edit, and delete content available in the system, such as articles, videos, and images.

9.2. The system shall allow administrators to add new content to the system.

9.3. The system shall provide version control for content, allowing administrators to revert to previous versions if necessary.

Priority Level: Medium

Precondition: Administrator account information is available in the system

Cross-references: N/A

10. Manage Users

10.1 The system shall provide access to administrators to manage user accounts in the system, such as creating new user accounts, editing existing ones, and deleting user accounts.

10.2. The system shall allow administrators to assign roles and permissions to users.

10.3. The system shall provide a way for administrators to reset user passwords if requested.

Priority Level: Medium

Precondition: Administrator account information is available in the system

Cross-references: 1.1, 8.1

4.2 System Quality Attributes

QA1: Performance: The system shall be able to process at least 1000 requests per second with an average response time of 500 milliseconds or less, and shall provide real-time recommendations to farmers.

Priority Level: High

Precondition: N/A

Cross-references: QA2

QA2: Security: The system shall use encryption and secure authentication methods to protect sensitive data and prevent unauthorized access.

Priority Level: High

Precondition: N/A

Cross-references: QA1, QA3

QA3: Scalability: The system shall be designed to handle future growth of the farm and its operations, with the ability to add new features and functionalities as needed.

Priority Level: Medium

Precondition: N/A

Cross-references: QA1, QA2

QA4: Accessibility: The system shall be accessible from different devices and operating systems with a user-friendly interface.

Priority Level: Medium

Precondition: N/A

Cross-references: QA5

QA5: Availability: The system shall be available for use 24/7 with a guaranteed uptime of at least 99%.

Priority Level: High

Precondition: N/A

Cross-references: QA1, QA4

QA6: Maintenance: The system shall have a minimum uptime of 99% and shall be designed with modularity and extensibility in mind, to facilitate regular updates and bug fixes without disrupting the overall functionality of the system.

Priority Level: Medium

Precondition: N/A

Cross-references: QA7

QA7: Interoperability: The system shall be able to integrate with other software tools used by farmers, such as accounting and finance software.

Priority Level: Low

Precondition: N/A

Cross-references: QA3, QA6

QA8: Usability: The system shall have an intuitive and user-friendly interface that requires minimal training for users to navigate and perform tasks effectively. The user interface shall be designed following established usability guidelines to enhance user experience and satisfaction.

Priority Level: Medium

Precondition: N/A

Cross-references: N/A

QA9: Reliability: The system shall be capable of maintaining data integrity and consistency, ensuring that no data is lost or corrupted during transactions or system failures.

Priority Level: High

Precondition: N/A

Cross-references: N/A

4.3 System Interface

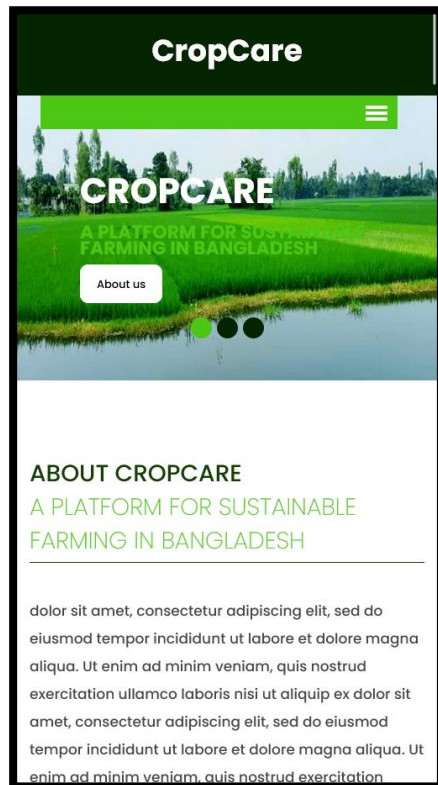


Figure 1: Home Page

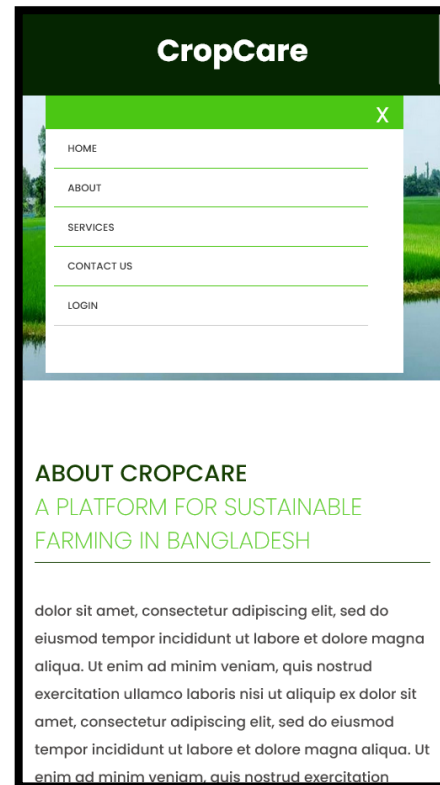


Figure 2: Homepage with Menu



Figure 3: Application Status

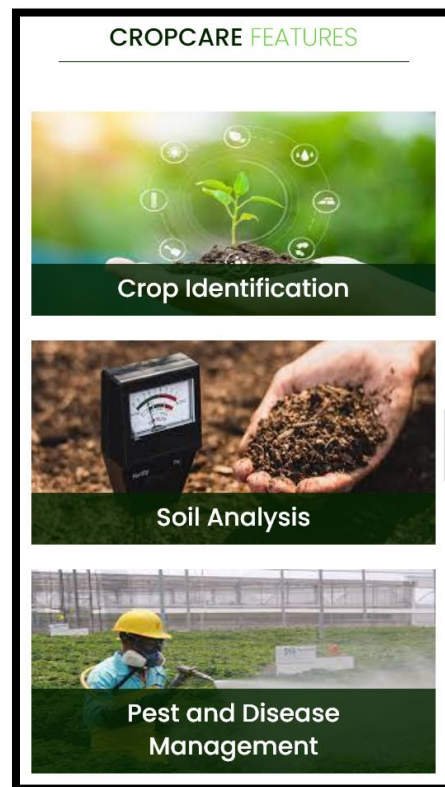


Figure 4: CropCare Features



Figure 5: CropCare Features

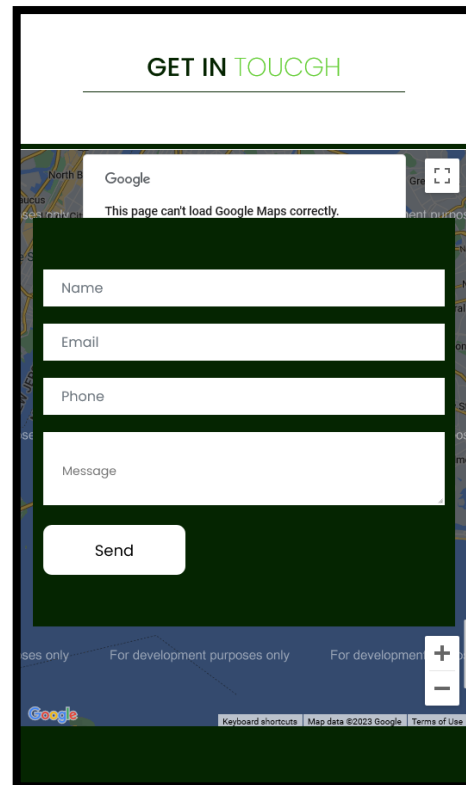


Figure 6: Contact Form

4.4 Project Requirements

Effort Estimation (COCOMO):

Software Project Type: Organic

Effort Factor: 2.4

P (Productivity exponent): 1.05

T (Time exponent): 0.38

Source Lines of Code (SLOC): 60,000

Effort Calculation:

Effort (PM) = Coefficient \langle Effort Factor $\rangle * (SLOC / 1000)^P$

$= 2.4 * (60,000 / 1000)^{1.05}$

$= 176.714$ person-months

Development Time Calculation:

$$\begin{aligned}\text{Development Time (DM)} &= 2.50 * (\text{PM})^T \\ &= 2.50 * (176.714)^{0.38} \\ &= 17.86 \text{ months}\end{aligned}$$

Required Number of People Calculation:

$$\begin{aligned}\text{Required Number of People (ST)} &= \text{PM} / \text{DM} \\ &= 176.714 / 17.86 \\ &= 9.89 \approx 10 \text{ people}\end{aligned}$$

Tester Allocation: With the required number of people being 10, 2 testers could be allocated for testing activities.

Budget estimation: For the budget estimation, the cost per person-month needs to be taken into consideration. An average cost of 30000 BDT per person-month is assumed.

Budget = Effort * Cost per Person-Month

$$\begin{aligned}&= 176.714 * 30000 \text{ BDT} \\ &= 5,301,420 \text{ BDT}\end{aligned}$$

5. FEATURES NOT TO BE TESTED

While comprehensive testing is essential for ensuring the quality of the CropCare platform, there are certain features and aspects that will not be tested as part of this project. These exclusions are outlined below:

1. Third-Party APIs and Services Integration:

The integration and functionality of third-party APIs or services used within the system, such as payment gateways, external weather data, and geolocation services, will not be tested in this scope. However, the interaction with these APIs will be verified during integration testing to ensure proper communication.

2. Browser and Device Compatibility:

Compatibility testing with specific browsers, devices, and operating systems will not be covered in this testing phase. While the application aims for broad compatibility, detailed cross-browser and cross-device testing will not be within the scope of this project.

3. Network Latency and Performance Testing:

Performance testing with varying network latency and connection speeds will not be conducted. While the system aims to perform well under different network conditions, detailed load and performance testing under specific network constraints will not be addressed in this project.

4. User Documentation Validation:

The validation and accuracy of user documentation, including user manuals and online help resources, will not be within the scope of this testing phase. The focus will be on the functionality of the software rather than the documentation content.

5. Regression Testing for Previously Resolved Defects:

Features or defects that have already been identified, resolved, and tested in previous iterations will not be re-tested unless there is a specific reason to revisit them due to code changes or functional modifications.

6. TESTING APPROACH

6.1 Testing Levels

CropCare will undergo multiple testing levels to ensure that the platform meets the specified requirements, functions correctly, and provides a seamless user experience. The testing levels for CropCare are as follows:

1. Unit Testing:

Unit testing involves testing individual components or modules of the software in isolation. In the context of CropCare, each functional module, such as login, crop identification, soil analysis, pest management, and others, will undergo thorough unit testing. This testing level ensures that each module works as intended and can handle various inputs and scenarios.

2. Integration Testing:

Integration testing focuses on testing the interactions and collaborations between different modules or components. In CropCare, various modules will be integrated to ensure that they function harmoniously and data is accurately shared between them. Integration testing will also verify the compatibility of the mobile application with the web-based dashboard.

3. System Testing:

System testing involves testing the entire integrated system as a whole. In CropCare, the complete mobile platform, including both the mobile application and the web-based dashboard, will be tested to ensure that all features work together as intended. This testing level will verify end-to-end functionality, including user interactions, data flow, and communication between different user classes.

4. User Acceptance Testing (UAT):

User Acceptance Testing involves testing the software from the perspective of its intended users. In the case of CropCare, farmers, agricultural experts, and administrators will actively participate in UAT. They will use the platform, perform typical tasks, and provide feedback on the user interface, functionality, and overall user experience. UAT ensures that the software aligns with user expectations and needs.

6.2 Test Tools

Unit Testing:

JUnit: A widely used testing framework for Java applications. It's suitable for unit testing individual Java classes and methods.

Integration Testing:

Postman: A versatile API testing tool that can be used to perform integration testing by sending HTTP requests to APIs and verifying responses.

System Testing:

Selenium: A popular web automation framework that can be used for end-to-end system testing. It allows the creation of automated tests that simulate user interactions in a browser.

User Acceptance Testing (UAT):

Manual Testing: While not a tool in the traditional sense, manual testing is essential for UAT. Testers (representing actual users) manually interact with the software to validate its usability, functionality, and overall user experience.

Performance Testing:

JMeter: A performance testing tool that can simulate heavy loads on servers, databases, and networks. It measures response times and identifies bottlenecks under various conditions.

Gatling: A load testing tool that's designed to be scalable, enabling simulation of thousands of users. It's suitable for performance and stress testing.

Security Testing:

OWASP ZAP: An open-source security testing tool for identifying security vulnerabilities in web applications.

Burp Suite: A widely used security testing tool for web applications that helps identify security flaws and vulnerabilities.

6.3 Meetings

1. Weekly Test Team Meeting:

Frequency: Once every week

Purpose: Evaluate progress, discuss ongoing testing activities, identify and address issues, and review error trends.

Participants: Test team members, including testers and quality assurance specialists.

Agenda:

- Review test plans and test cases completed during the week.
- Discuss any challenges or roadblocks encountered during testing.
- Share insights and findings from testing activities.
- Identify trends in errors and defects.
- Plan testing activities for the upcoming week.
- Action Items: Assign tasks for addressing defects, updating test cases, and planning for next week's testing.

2. Bi-weekly Test Team Leader Meeting:

Frequency: Once every two weeks

Purpose: Provide a higher-level overview of testing progress and issues to the project manager and development team.

Participants: Test team leader, development team representatives, and project manager.

Agenda:

- Present testing progress and results from the past two weeks.
- Highlight any critical defects or roadblocks that need attention.
- Discuss any adjustments to the testing strategy or priorities.
- Align testing efforts with the overall project timeline.
- Action Items: Address any high-priority defects or testing challenges identified during the meeting.

3. Ad-hoc Meetings for Emergencies:

Frequency: As required

Purpose: Address urgent or critical issues that require immediate attention.

Participants: Relevant team members, including testers, developers, and project manager.

Agenda:

- Discuss the nature and severity of the emergency.
- Identify potential solutions and action steps.
- Assign responsibilities for resolving the emergency situation.
- Action Items: Take immediate action to address the emergency and prevent further impact on the project.

7. TEST CASES/TEST ITEMS

System Login:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_1_Login_001	Test Designed date:	11-Aug-23		
Test Priority:	Medium	Test Executed by:	Setu		
Module Name:	Login Session	Test Executed date:	12-Aug-23		
Test Title:	Verify successful login with valid username and password				
Description:	Test website login page				
Precondition (if any):	User must have valid username and password				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Login Page 3.Enter username 4.Enter password 5.Click Login		Username: Shuvo Password: P@ss_Word	User should login into the application	As expected,	Pass
Post Condition: User is validated with database and successfully login to account. The account session details are logged in the database.					

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_1_Login_002	Test Designed date:	11-Aug-23		
Test Priority:	Medium	Test Executed by:	Setu		
Module Name:	Login Session	Test Executed date:	12-Aug-23		
Test Title:	Verify error message for incorrect login				
Description:	Test website login page				
Precondition (if any):	User account information is available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Login Page 3.Enter username 4.Enter password 5.Click Login		Username: Setu Password: 123456789	Error message is displayed indicating incorrect username or password	As expected,	Pass
Post Condition: User is not logged in, and the error message is displayed					

Crop Identification:

Project Name:		CropCare	Test Designed by:		Shuvo
Test Case ID:		FR_2_CropIdentification_001	Test Designed date:		11-Aug-23
Test Priority:		High	Test Executed by:		Setu
Module Name:		Crop Identification	Test Executed date:		12-Aug-23
Test Title:		Verify accurate crop identification using image recognition			
Description:		Test the system's ability to accurately identify different types of crops using image recognition technology			
Precondition (if any):		Images of various crops are available in the system			
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Login Page 3.Enter username 4.Enter password 5.Click Login 6.Go to Crop Identification 7. Click on browse 8. Select a Image of a Crop 9. Click Submit		Username: Setu Password: P@\$sW0rd Image: Corn.jpeg	System accurately identifies the crop and displays the correct crop name and informatio	As expected,	Pass
Post Condition: System accurately identifies known crops and provides correct information					

Soil Analysis:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_3_SoilAnalysis_001	Test Designed date:	11-Aug-23		
Test Priority:	High	Test Executed by:	Setu		
Module Name:	Soil Analysis	Test Executed date:	12-Aug-23		
Test Title:	Verify accurate soil analysis and recommendations				
Description:	Test the system's ability to accurately analyze soil samples and provide appropriate recommendations based on crop type, soil pH, nutrient content, and other factors				
Precondition (if any):	Soil samples are taken and uploaded to the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Soil Analysis 3. Enter Crop Type 4. Enter Soil pH 5. Select Nutrient contents 6. Click Submit		Crop Type: Corn Soil pH: 6.5 Nutrient Content: •Nitrogen, •Phosphorus, •Potassium, •Calcium	System displays detailed soil analysis results including recommended fertilizers and additives based on entered data	As expected,	Pass
Post Condition: System provides accurate soil analysis and recommendations for different soil samples					

Pest and Disease Management:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_4_PestDiseaseManagement_001	Test Designed date:	11-Aug-23		
Test Priority:	High	Test Executed by:	Setu		
Module Name:	Pest and Disease Management	Test Executed date:	12-Aug-23		
Test Title:	Verify accurate pest and disease management recommendations				
Description:	Test the system's ability to provide accurate recommendations for pest and disease management based on crop type, location, and weather conditions				
Precondition (if any):	Data collected from sensors and other sources are available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Pest and Disease Management 3. Enter Crop Type 4. Enter Location 5. Enter Weather Condition 6. Click Submit		Crop Type: Corn Loction: Barishal Weather conditions: Sunny	System accurately recommends pest and disease management strategies based on entered data	As expected,	Pass
Post Condition: System provides accurate pest and disease management recommendations for different crop and location data					

Irrigation Management:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_5_IrrigationManagement_001	Test Designed date:	11-Aug-23		
Test Priority:	High	Test Executed by:	Setu		
Module Name:	Irrigation Management	Test Executed date:	12-Aug-23		
Test Title:	Verify accurate irrigation recommendations				
Description:	Test the system's ability to provide accurate recommendations for irrigation timing and amount based on crop type, soil type, weather conditions, and other relevant factors				
Precondition (if any):	Data collected from soil moisture sensors are available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Irrigation Management 3. Enter Crop Type 4. Enter Soil Type 5. Enter Weather Condition 6. Click Submit		Crop Type: Corn Soil Type: Clay Weather conditions: Rainy	System accurately recommends irrigation timing and amount based on entered data	As expected,	Pass
Post Condition: System provides accurate irrigation recommendations for different crop and soil data					

Harvest Planning:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_6_HarvestPlanning_001	Test Designed date:	11-Aug-23		
Test Priority:	Medium	Test Executed by:	Setu		
Module Name:	Harvest Planning	Test Executed date:	12-Aug-23		
Test Title:	Verify accurate harvest recommendations				
Description:	Test the system's ability to provide accurate recommendations for the optimal time to harvest crops based on weather, soil, crop conditions, maturity, and market demand				
Precondition (if any):	Crop data and market demand data are available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Harvest Planning 3. Enter Crop Type 4. Enter Plantation Date 5. Enter Weather Condition 6. Click Submit		Crop Type: Soybean Plantation Date: 15 July 2023 Weather conditions: Rainy	System accurately recommends optimal harvest time based on entered data	As expected,	Pass
Post Condition: System provides accurate recommendations for optimal harvest time for different crop and environmental data					

Inventory Management:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_7_InventoryManagement_001	Test Designed date:	11-Aug-23		
Test Priority:	Medium	Test Executed by:	Setu		
Module Name:	Inventory Management	Test Executed date:	12-Aug-23		
Test Title:	Verify accurate tracking of inventory				
Description:	Test the system's ability to accurately track the amount and type of seeds, fertilizers, pesticides, and other supplies used in the farm				
Precondition (if any):	Inventory data is available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Inventory Management 3. Enter Item Type 4. Enter Quantity 5. Enter Supplier's Name 6. Enter Expiry date 7. Click Add		Item Type: Seed Quantity: 100 Supplier's Name: Advanta Expiry Date: 24 July 2025	Inventory item is successfully added to the system	As expected,	Pass
Post Condition: System accurately tracks inventory items and their details					

Manage Content:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_9_ManageContent_001	Test Designed date:	11-Aug-23		
Test Priority:	Medium	Test Executed by:	Setu		
Module Name:	Manage Content	Test Executed date:	12-Aug-23		
Test Title:	Verify access to content management				
Description:	Test the system's ability to provide access to administrators for viewing, editing, and deleting content in the system				
Precondition (if any):	Administrator account information is available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2.Go to Enter Username 3. Enter Enter Password 4. Navigate to content management section 5. Click on Add 6. Select Type 7. Enter Title 8. Enter Content 9. Click Publish		Username: Shuvo Password: P@ss_Word Type: Article Title: Test Title Content: Test Post	Administrator successfully logs in to the system & published an article.	As expected,	Pass
Post Condition: Administrators can add new articles, videos, and images to the system					

Manage Users:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_10_ManageUsers_001	Test Designed date:	11-Aug-23		
Test Priority:	High	Test Executed by:	Setu		
Module Name:	Manage Users	Test Executed date:	12-Aug-23		
Test Title:	Verify user account management				
Description:	Test the system's ability to provide administrators access to manage user accounts creating new accounts				
Precondition (if any):	Administrator account information is available in the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1.Go to the website 2. Navigate to user account management section 3. Click on Add User 4. Enter Username 5. Enter Password 6. Select Role 7. Click Create User		Username: Karim Password: N3wU\$3r Role: Farmer	New user account is successfully created	As expected,	Pass
Post Condition: Administrators can manage user accounts, create new accounts, edit existing ones, and delete accounts					

System Logout:

Project Name:	CropCare	Test Designed by:	Shuvo		
Test Case ID:	FR_8_SystemLogout_001	Test Designed date:	11-Aug-23		
Test Priority:	Low	Test Executed by:	Setu		
Module Name:	System Logout	Test Executed date:	12-Aug-23		
Test Title:	Verify user logout functionality				
Description:	Test the system's ability to provide a logout button for users to log out of the system, clear the user's session, remove saved login credentials, and redirect the user to the login screen after logout				
Precondition (if any):	User is currently logged into the system				
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Goto Homepage 3. Click on Profile 4. Click on Logout			User session is cleared, saved login credentials are removed, and user is redirected to the login screen	As expected,	Pass
Post Condition: User is logged out of the system, session is cleared, and login credentials are removed					

8. ITEM PASS/FAIL CRITERIA

Once all test cases for CropCare have been executed, the following criteria will be used to determine whether the system passes or fails:

1. **Test Case Success Rate:** If at least 98% of the test cases have been executed successfully without critical issues, the system will be considered for further evaluation.
2. **Bug Identification:** All identified bugs and issues must be documented and categorized. Critical and high-priority issues must be resolved before considering the system for release.
3. **Trial Outcome Recommendations:** The test team leader will provide recommendations based on the outcomes of the trial. These recommendations will be reviewed by the development and project management teams.
4. **Business Impact Analysis:** The impact of open and closed incidents on the business scenarios will be analyzed. Incidents that have an acceptable impact on business functionality will be considered.
5. **Incident Resolution:** Open incidents will be assessed for possible solutions and workarounds. If viable solutions are available and implemented, it will contribute to the decision-making process.

6. **Functionality Assessment:** The ability of CropCare to provide the required functionality for the business will be assessed. The technology's impact on business processes will also be considered.
7. **Final Decision:** The test lead and project manager will jointly make the final decision on whether to release the program. This decision will be based on a comprehensive evaluation of the trial outcomes, bug resolution, business impact, and functionality assessment.

9. TEST DELIVERABLES

- Test Plan Document
- Test Strategy Document
- Test Case Documents
- Test Execution Reports
- Defect Reports
- Test Environment Setup Documentation
- Test Summary Report
- Exit Criteria Documentation
- User Acceptance Testing (UAT) Documentation
- Test Closure Report

10. STAFFING AND TRAINING NEEDS

Staffing:

- **Test Manager:** Responsible for overall test planning, strategy, and coordination with stakeholders.
- **Test Lead:** In charge of test design, execution, and reporting. Coordinates the testing team.
- **Test Engineers:** Execute test cases, report defects, and collaborate with developers for issue resolution.
- **Automation Test Engineers:** Develop and maintain automated test scripts for regression and functional testing.
- **Domain Experts:** Provide agricultural knowledge and insights to ensure accurate testing of domain-specific features.
- **Performance Testers:** Conduct load, stress, and performance testing to ensure application stability.

Skills and Qualifications:

- Testing team members should have a solid understanding of software testing principles and methodologies.
- Automation testers need proficiency in scripting languages (e.g., Python) and automation tools (e.g., Selenium).

- Performance testers require expertise in performance testing tools (e.g., JMeter) and performance analysis.
- Domain experts should possess knowledge of farming practices, crop types, and related terminology.

Training Needs:

- Basic and advanced software testing methodologies and techniques.
- Automation testing frameworks and scripting languages.
- Performance testing concepts, tools, and analysis.
- Agricultural domain knowledge for domain experts.
- Collaboration and communication skills for effective teamwork.

11. RESPONSIBILITIES

Responsibility	TM	PM	Dev Team	Test Team	Client
Acceptance Test Documentation & Execution		√		√	√
System/Integration Test Documentation & Execution		√		√	
Unit Test Documentation & Execution	√	√	√	√	
System Design Reviews	√	√	√	√	√
Detail Design Reviews	√	√	√	√	√
Test Procedures and Rules	√	√	√	√	
Screen & Report Prototype Reviews	√	√	√	√	
Change Control and Regression Testing	√	√	√	√	√

12. TESTING SCHEDULE

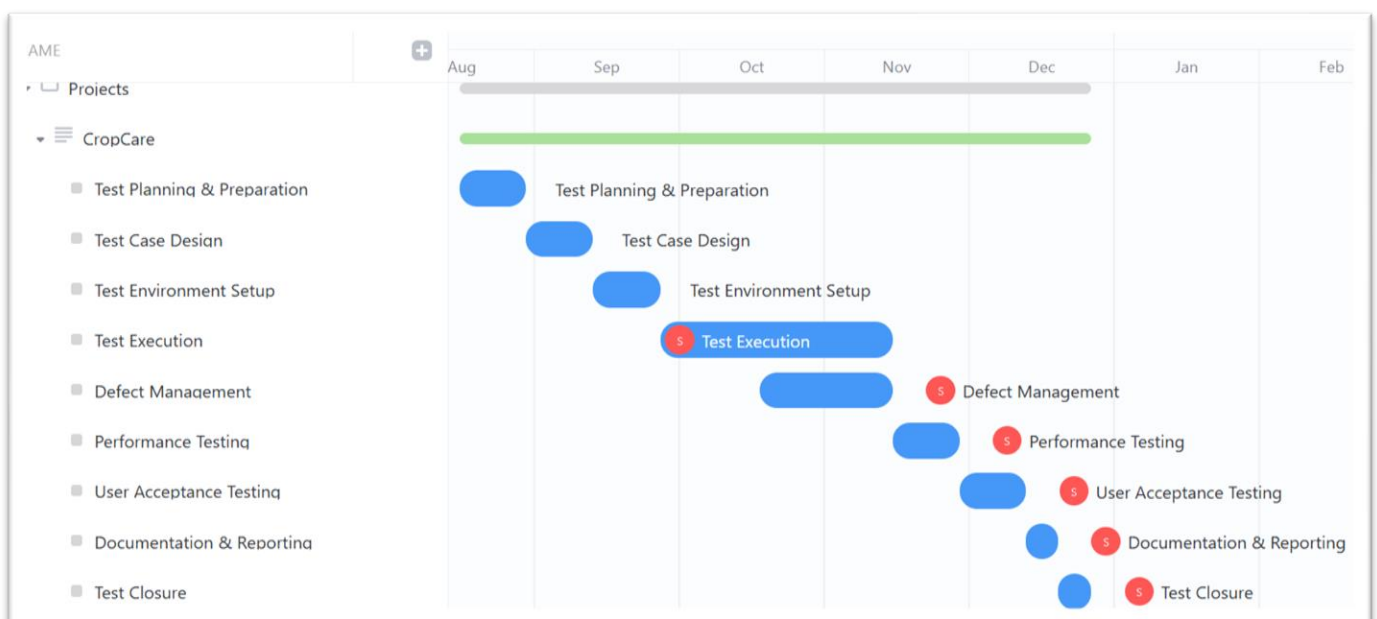


Figure 7: Testing Schedule

13. PLANNING RISKS AND CONTINGENCIES

Risk Description	Contingency Plan
Insufficient Test Data	Generate synthetic test data that closely resembles real-world scenarios.
Delay in Test Environment Setup	Prioritize critical modules for testing, use staging environment if needed.
High Volume of Defects	Allocate additional resources to defect resolution, implement triage process.
Change in Requirements	Ensure clear communication channels between development and testing teams.
Unavailability of Stakeholders	Establish alternate points of contact, reschedule meetings if necessary.
Performance Bottlenecks	Conduct load testing earlier in the cycle, optimize code as needed.
Test Environment Failures	Maintain backup environments, quickly troubleshoot and fix environment issues.
UAT Reveals Critical Issues	Rapidly address identified issues, engage development team for quick fixes.
Limited User Participation in UAT	Identify key user representatives, ensure their active involvement in UAT.
Inadequate Training for Testing Tools	Provide training sessions, assign experienced team members to assist.
Scope Creep	Implement strict change control procedures, assess impact before adding features.

14. APPROVALS

Role	Assigned	Signature
Project Sponsor	Faridul Haque	<i>Faridul</i>
Development Management	Mohammad Shuvo Ali	<i>Shuvo</i>
EDI Project Manager	Mohammad Shuvo Ali	<i>Shuvo</i>
RS Test Manager	Umma Shara Ali Setu	<i>Setu</i>
RS Development Team Manager	Umma Shara Ali Setu	<i>Setu</i>
Reassigned Sales	Sabrina Ahmed	<i>Sabrina</i>
Order Entry EDI Team Manager	Rahim Khan	<i>Rahim</i>