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Department of Computer Science

Faculty of Science & Technology (FST)

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Section: C

Software Quality Assurance and Testing

Test Plan of Application for Locating Shops with Scanned Product Availability

A Report submitted
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Software Test Plan

for

<Application for Locating Shops with
Scanned Product Availability>

Version 1.1 approved

Prepared by <Samin Mohammed, Nahidul Islam, Md. Shihab Hossain>

<American International University of Bangladesh>

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Revision History

Revision	Date	Updated by	Update Comments
0.1	2022.04.15	Samin Mohammed	First Draft (Background + Solution + Quality Attributes)
0.2	2022.04.17	Nahidul Islam	System Interface + System Features Added
0.3	2022.04.17	Samin Mohammed	Testing Approach + Added
0.4	2022.04.19	Md. Shihab Hossain	Test Cases Added+ Selenium Testing
0.5	2022.04.19	Nahidul Islam	Project Criteria+ Approvals+ Schedule Complete
1.0	2022.04.19	Samin Mohammed	Second Draft Complete
1.1	2022.04.20	Md. Shihab Hossain	Test Case + Gantt Chart Fixed
2.0	2022.04.21	Nahidul Islam	Final Draft Complete

1. TEST PLAN IDENTIFIER: TP-E2AR 2.0

2. INTRODUCTION

Background to the Problem

- Advertisement is a means to make people aware of any product or a service using commercial methods. It is a sort of publicity that is designed to endorse a specific interest of a person intended for product sale. The impact that advertisements create in launch and promotion of a product overweighs its disadvantages. These disadvantages include the unavailability of advertised product at a store or the remaining validity of the offered advertisement. Moreover, the exact location of the store as well as the directions may be unclear. If these 3 problems were to be addressed then advertisements would provide a more in-depth interactive experience for the customer as well as generate more interest in the product advertised.
- The root cause for these problems would be that the advertisements can only provide so much information. If there is too detailed information given, the reader would lose interest reading or ignore the advertisement completely. Moreover, the advertisements are either static or not updated in real time. So, it is very probable that the offer advertised is no longer valid or the product is sold out or available only in certain stores and not all. This leads to the challenge of finding those select stores which is a big hassle.

In technology advanced business world, advertising has been seen to play a critical role for the establishment of contact between sellers and buyers. It is a medium by which the customer learns about the existence and use of goods that are available in the market place. As there is a lot of competition among businesses in various domains, advertisement has become a profitable investment that helps businesses to reach to nooks and corners of the world and target their potential customers. In this regard, overcoming the above-mentioned hurdles is crucial.

Solution to the Problem

- The solution to the problems would be a software that would provide verification on the validity and availability of the advertised product as well as offer navigational directions to the store with the advertised product available. This verification can be achieved through barcode scanning technology.
- Let us assume, with every advertisement there is a product specific barcode attached as well. If customers were to garner interest in the product, they would simply have to scan the attached barcode on the advertisement. After scanning, the customer will know if the advertised benefits are still available, the product itself is available or not and if available, directions to the stores with product available will be provided. All these features serve to achieve the aforementioned business objective of more sales through advertisements. Thus, it is feasible.

- At the moment, there are a number of shopbots which provide consumers ways to find out the shops which sell the desired product with the cheaper price easily. Reviews of the products can be posted on the platform to share the feedback or experiences of the consumers. By using these posted reviews, consumers can carefully examine the quality and condition of the product. Recommendation systems of the shopbots can further suggest other related products which consumers may be interested in. Most of the existing shopbots focus on searching the products by lower price or better quality. However, these shopbots do not offer the same benefits and services offered by our proposed system.

The closest comparison to our system is the Where2Buy application which is a Location-Based Shopping App with Products-wise Searching. This system searches products based on the user input and displays that product and its availability in different shops and their location. Our system is very similar but the difference being the scanning of advertisements to achieve similar results. Ideally, this software would benefit the company that would use it for the convenience of their existing customers and attracting new users.

3. REQUIREMENT SPECIFICATION

3.1 System Features

- 1. Register User
Functional Requirements
 - 1.1 The system requests a username and password.
 - 1.2 The user enters a username and password.
 - 1.3 The system checks that the username does not duplicate any existing registered usernames.
 - 1.4 The system requests a name, gender, address, phone and email address.
 - 1.5 The user enters the information.
 - 1.6 The system determines the user's location and access level and stores all user information.

Priority Level: High

Precondition: none

- 2. Login
Functional Requirements
 - 2.1 The system requests the username and password.
 - 2.2 The user enters his username and password.
 - 2.3 The system verifies the username and password against all registered users.
 - 2.4 The system starts a login session and displays a welcome message based on the user's preferences.

Priority Level: High

Precondition: user have valid user id and password

- 3. Navigation System

Functional Requirements

3.1 The software will provide directions for multiple shops with product available.

3.2 If the product available shop is more than one, calculate the trave times and distances of all shops to find closest one.

3.3 Allow 360-degree street view imagery (optional)

Priority Level: High

Precondition: user must have scanned QR code

- 4. QR Scanner

Functional Requirements

4.1 The system must allow the user to scan QR codes and Barcodes.

4.2 The system must decode the scanned QR codes and Barcodes to references.

4.3 The system must request user for permission to access device camera.

4.4 The system upon scanning, will show all necessary information relating to the scanned product

Priority Level: High

Precondition: user must be logged in

- 5. Logout

Functional Requirements

5.1 The software will allow the user to exit the system by using Logout feature.

5.2 The user will find Logout on top of every window, after once logged in.

5.3 By clicking Logout, the user will find another window. That window will come with two options Exit and Cancel with a message.

5.4 If the user click exit, the user will be able to exit the system.

5.5 If the user click cancel, the user will be still logged in.

Priority Level: High

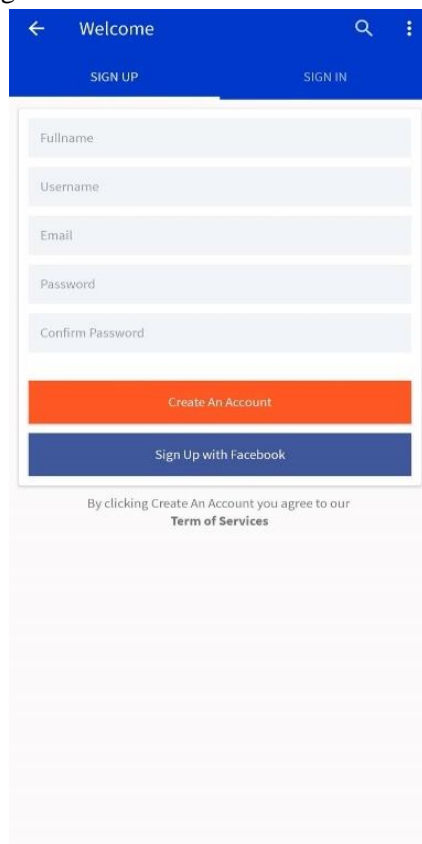
Precondition: user must be logged in to the system

3.2 System Quality Attributes

- **Efficiency:** The app shall be completely operational at least 95% of the time with 30% memory resources available at the planned peak load conditions and downtime after failure should not exceed 5 minutes.
- **Integrity:** The app should prevent unauthorized access to system functions, ensure safety from virus infections and prevent leaking of private information.
- **Usability:** A trained user shall be able to scan the barcode displayed in the advertisement and receive availability information and directions to location in an average of 15 seconds and 1 minute maximum
- **Correctness:** The app shall display the accurate information of the product corresponding to the scanned code.
- **Reliability:** The app shall display product availability at shops located in the surrounding area and the path navigation should be accurate.

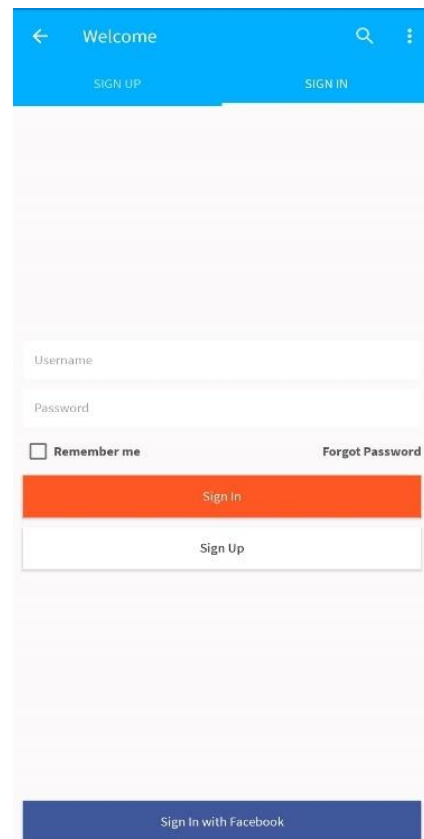
3.3 System Interface

- At first, users will have to register to the system. After Registration the User can Login with their registered credentials



The Registration Page UI features a blue header with a back arrow, 'Welcome' text, a search icon, and a menu icon. Below the header, there are two tabs: 'SIGN UP' (active) and 'SIGN IN'. The main content area contains a registration form with the following fields: Fullname, Username, Email, Password, and Confirm Password. Below these fields are two buttons: 'Create An Account' (orange) and 'Sign Up with Facebook' (blue). At the bottom, there is a disclaimer: 'By clicking Create An Account you agree to our Term of Services'.

Fig 1: Registration Page



The Login Page UI features a blue header with a back arrow, 'Welcome' text, a search icon, and a menu icon. Below the header, there are two tabs: 'SIGN UP' and 'SIGN IN' (active). The main content area contains a login form with the following fields: Username and Password. Below these fields are two links: 'Remember me' (with a checkbox) and 'Forgot Password'. Below these links are two buttons: 'Sign In' (orange) and 'Sign Up' (white). At the bottom, there is a button: 'Sign In with Facebook' (blue).

Fig 2: Login Page

- After successful login, the user can use the QR scanner to scan the bar code given in the advertisement. Upon successful scan, the stores with item available will be displayed using the star icon. The stores with the item sold out will also be shown with the red circle icon.

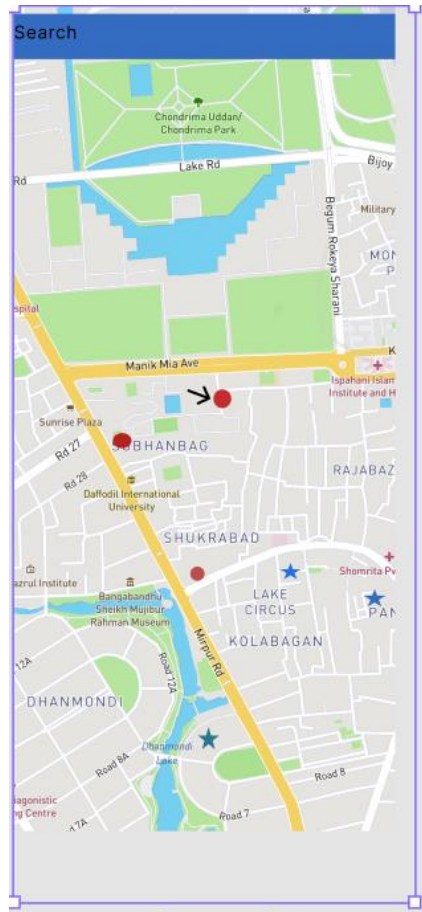


Fig 3: Shop Location Display Page



Fig 4: QR Code Scanner Page

3.4 Project Requirements

- List of project constraints (e.g., time, budget, resources, environment, etc.) that should be followed in the project management is shown below with calculation,

i.	Android Support:	160 hours x 37 BDT/ hour	5,920 BDT
ii.	iOS Support:	160 hours x 37BDT/hour	5,920 BDT
iii.	Map List of Location:	Setup	32 hours x 37BDT/hour 1,184 BDT
		Development	120 hours x 37BDT/hour 4,440 BDT

		Maintenance	75 hours x 37BDT/hour	2,775 BDT
iv.	QR Code Scanning:		100 hours x 37BDT/hour	3,700 BDT
v.	Customer Feedback Form		250 hours x 37BDT/hour	9,250 BDT
vi.	Loyalty Points		296 hours x 37BDT/hour	10,952 BDT
vii.	Sign up Through Email/FB	Setup	160 hours x 37BDT/hour	5,920 BDT
		Development	64 hours x 37BDT/hour	2,368 BDT
		Maintenance	160 hours x 37BDT/hour	5,922 BDT
viii.	User Profile Activity	Setup	48 hours x 37BDT/hour	1,776 BDT
		Development	80 hours x 37BDT/hour	2,960 BDT
		Maintenance	64 hours x 37BDT/hour	2,368 BDT
ix.	Send Push Notification	Setup	40 hours x 37BDT/hour	1,480 BDT
		Development	480 hours x 37BDT/hour	17,760 BDT
		Maintenance	32 hours x 37BDT/hour	1,184 BDT
x.	Camera (Barcode Scanning)	Setup	40 hours x 37BDT/hour	1,480 BDT
		Development	296 hours x 37BDT/hour	10,952 BDT
xi.	SDK	Setup	80 hours x 37BDT/hour	2,960 BDT
		Development	180 hours x 37BDT/hour	6,660 BDT
xii.	GPS and Geo Fences	Setup	120 hours x 37BDT/hour	2,960 BDT
		Development	480 hours x 37BDT/hour	17,760 BDT
		Maintenance	100 hours x 37BDT/hour	3,700 BDT

Item	Setup Cost	Development Cost	Monthly Cost of Servers/Services
Android Support		5,920	
iOS Support		5,920	
Map List of Location	1,184	4,440	2,775
QR Code Scanning		3,700	
Customer Feedback Form		9,250	
Loyalty Points		10,952	

Sign up Through Email/Facebook	5,920	2,368	5,920
User Profile Activity	1,776	2,960	2,368
Send Push Notification	1,480	17,760	1,184
Camera (Barcode Scanning)	1,480	10,952	
SDK	2,960	6,660	
GPS and Geo Fences	2,960	17,760	3,700
Total	17,760	98,642	15,947

- Total budget 1,80,000 BDT
- Total cost = $(17,760 + 98,642 + 15,947) = 132,349$ BDT
- Expected Remaining budget $(1,80,000 - 1,32,349) = 47,651$ BDT
- Total Development Time 1 year 4 months (9617 hours)

4. FEATURES NOT TO BE TESTED

The following is a list of the areas that will not be specifically addressed or omitted completely,

- Push Notifications: Based on the recently scanned products of the user, more offers based on the users' preferences would be sent via push notifications. This feature was skipped due to time constraints
- Loyalty Points: If the user purchases the same brand of products from a store chain, they would receive loyalty points that they can avail for various perks. This feature was ultimately passed on due to complexity faced during development.

5. TESTING APPROACH

5.1 Testing Levels

- The testing for the Advertisement based Shop finder project will consist of Unit, System/Integration (combined) and Acceptance test levels. It is hoped that there will be at least one full time

independent test person for system/integration testing. However, with the budget constraints and timeline established; most testing will be done by the test manager with the development teams' participation.

- UNIT Testing will be done by the developer and will be approved by the development team leader. Proof of unit testing (test case list, sample output, data printouts, defect information) must be provided by the programmer to the team leader before unit testing will be accepted and passed on to the test person. All unit test information will also be provided to the test person. For unit testing, each module for the system will be tested individually. So, the system functions i.e., Registration, Login, QR Scanner and GPS will be tested individually.
- SYSTEM/INTEGRATION Testing will be performed by the test manager and development team leader with assistance from the individual developers as required. No specific test tools are available for this project. Programs will enter into System/Integration test after all critical defects have been corrected. A program may have up to two Major defects as long as they do not impede testing of the program. System testing is performed on the complete, App system. It allows checking system's compliance as per the requirements. It tests the overall interaction of components. It involves load, performance, reliability and security testing.
- ACCEPTANCE Testing will be performed by the actual end users with the assistance of the test manager and development team leader. The acceptance test will be done in parallel with the existing manual ZIP/FAX process for a period of one month after completion of the System/Integration test process. Acceptance testing is at first done in house by the development team from the perspective of the client. If the app satisfies the development team, it is sent for official acceptance testing to the users. If it meets the client's requirements, then they accept the app with or without agreeing upon some future requirements to be implemented.

5.2 Test Tools

The only test tools to be utilized is the Selenium IDE chrome extension. Selenium was used for automated testing of the Login Page, Registration Page and Services page of website as shown below,

Registration Page: The Selenium IDE begins testing the Registration page. It checks all the actions performed on the page as well as the inputs given. As everything is working as expected, the step becomes green

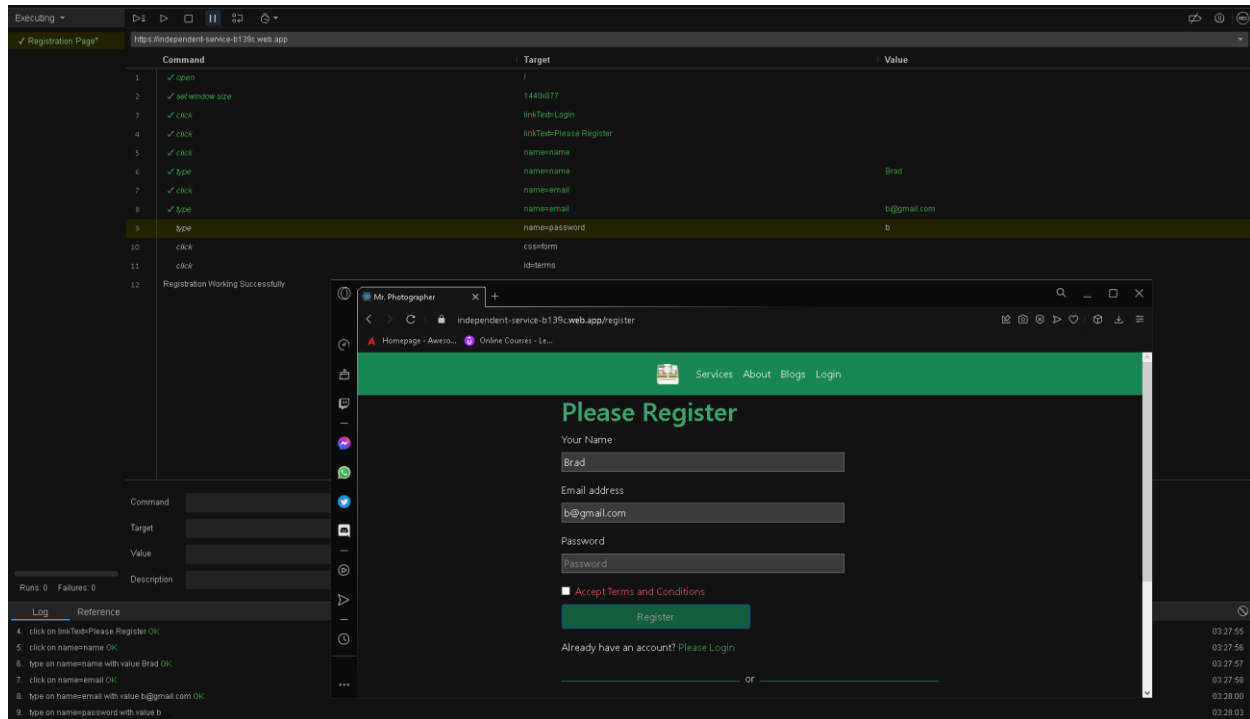


Fig 5: Registration Page Testing

After validating all the steps, the pop-up window closes. And all the steps are green. So testing was done successfully.

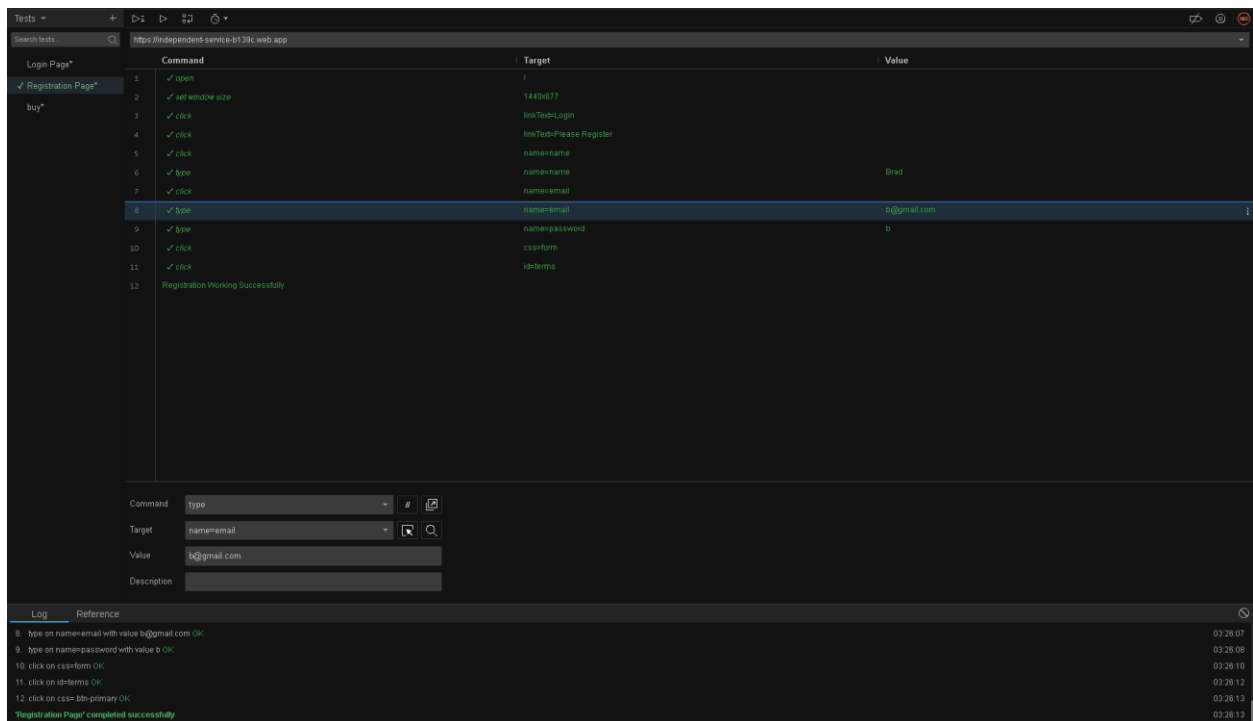


Fig 6: Registration Page Testing Completed Successfully

Login Page: The Login Page verification starts from the login page. Just for testing purposes, invalid input was given to see if it could detect the mistake properly which it did.

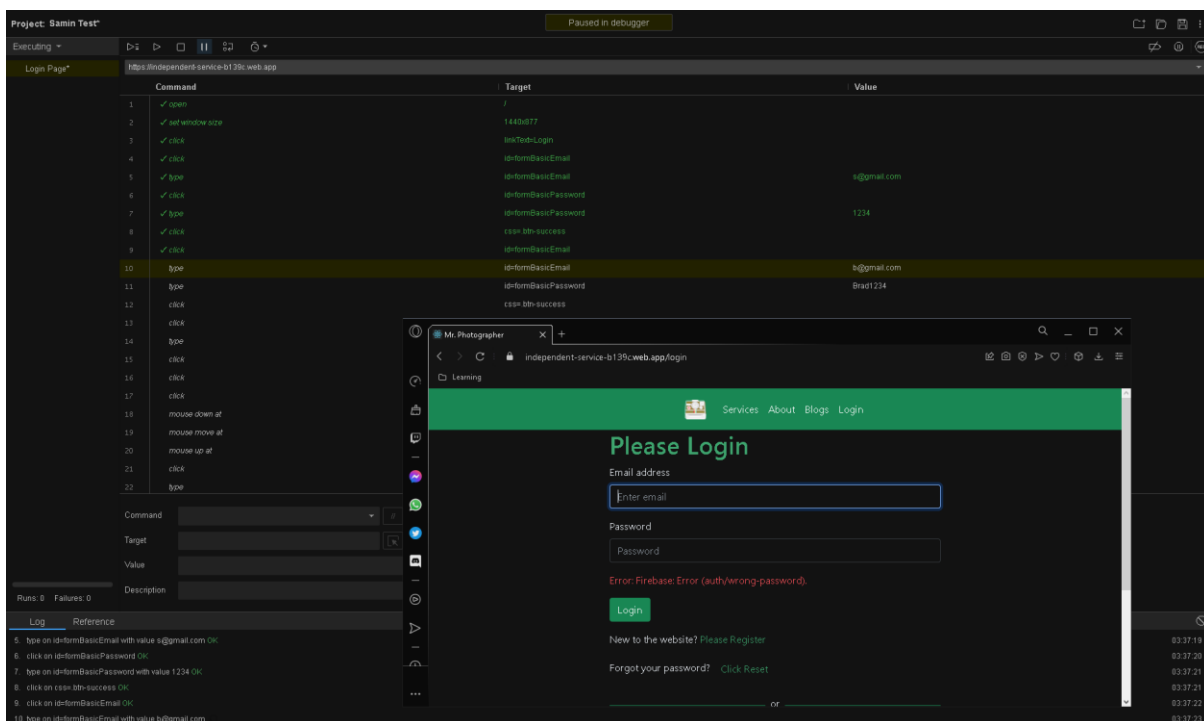


Fig 7: Login Page Testing Incorrect Password Phase

For this reason, the number of inputs is longer than the registration page. However, everything still tested fine so the test is successful.

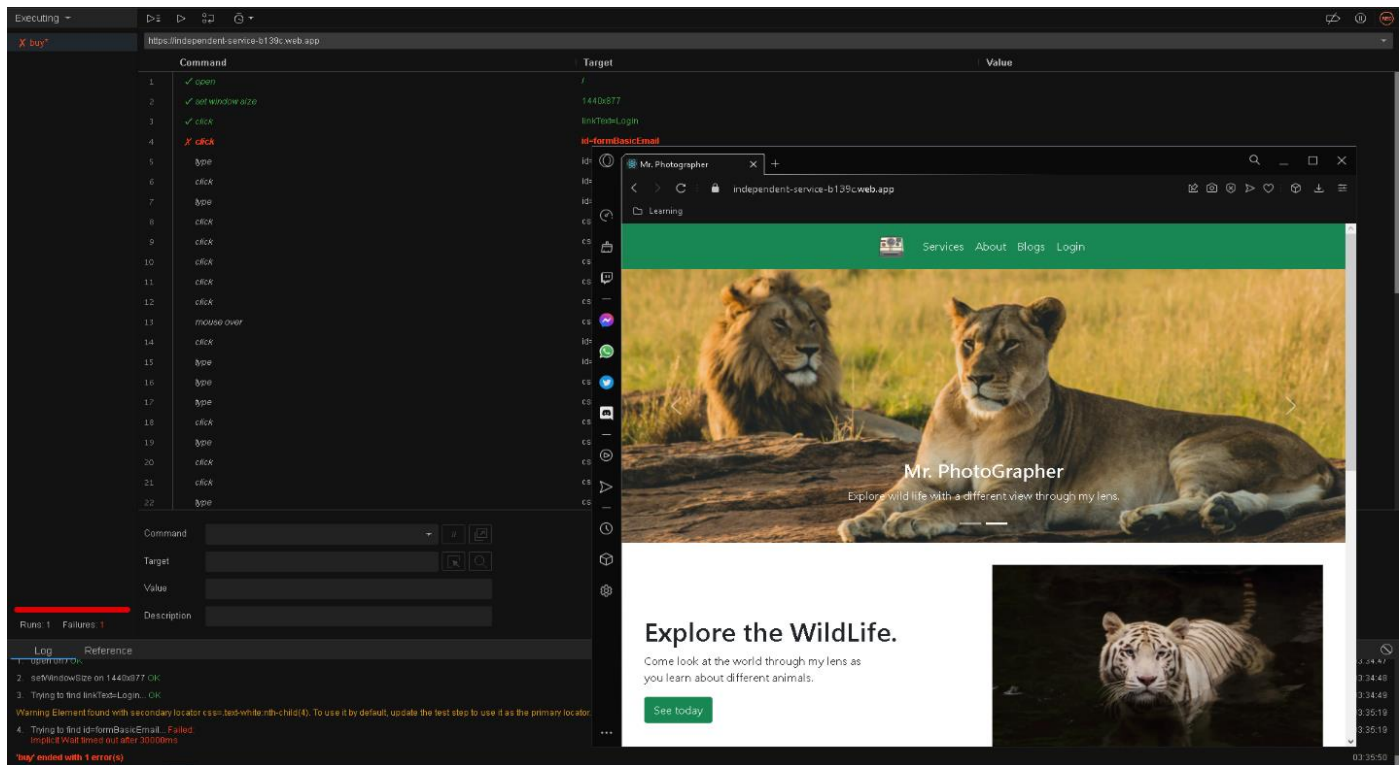


Fig 10: Services Testing ended abruptly due to error in functionality

5.3 Meetings

The test team will meet once every week to evaluate progress to date and to identify error trends and problems as early as possible. The test team leader will meet with development and the project manager once every two weeks. These two meetings will be scheduled on different weeks. Additional meetings can be called as required for emergency situations. Besides this, meeting will be called with the client during the beta test and acceptance testing phase.

6. TEST CASES/TEST ITEMS

Number: 1

Project Name: Ad to Shop application			Test Designed by: Nahidul Islam		
Test Case ID: FR_1			Test Designed date: 18-04-2022		
Test Priority (Low, Medium, High): High			Test Executed by: Md. Shihab Hossain		
Module Name: Registration Session			Test Execution date: 19-04-2022		
Test Title: register with valid username and password					
Description: Test app registration page					
Precondition (If any): None					
Test Steps		Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the Home page 2. Enter Full name 3. Enter email 4. Enter username 5. Enter password 6. Confirm Password 7. Click submit		Username: to be set Password: to be set	User should enter credentials for registration	As expected,	Pass

Post Condition: User is met with a pop- up that confirms successful registration.

Number: 2

Project Name: Ad to Shop application			Test Designed by: Nahidul Islam		
Test Case ID: FR_2			Test Designed date: 18-04-2022		
Test Priority (Low, Medium, High): High			Test Executed by: Samin Mohammed		
Module Name: Login Session			Test Execution date: 19-04-2022		
Test Title: verify login with valid username and password					
Description: Test app 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. Enter username 3. Enter password 4. Click submit		Username: Samin2o35 Password: 321	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.

Number :3

Project Name: Ad to Shop application		Test Designed by: Nahidul Islam		
Test Case ID: FR_3		Test Designed date: 18-04-2022		
Test Priority (Low, Medium, High): High		Test Executed by: Md. Shihab Hossain		
Module Name: QR Scan Session		Test Execution date: 19-04-2022		
Test Title: verify if bar code can be scanned				
Description: Test QR scan page				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the scanner icon on main page after login 2. Allow permission to access phone camera 3. Wait for scan confirmation	Username: Scan completed	Confirmation pop-up should appear and list of available shops begin to load as well as location	As expected,	Pass

Post Condition: User gets the information related to product successfully and can navigate to nearby shops.

Number: 4

Project Name: Ad to Shop application			Test Designed by: Nahidul Islam	
Test Case ID: FR_4			Test Designed date: 18-04-2022	
Test Priority (Low, Medium, High): High			Test Executed by: Samin Mohammed	
Module Name: Navigation Session			Test Execution date: 19-04-2022	
Test Title: verify logout of profile				
Description: Test website profile page				
Precondition (If any): User must be logged in				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)

1. Go to options 2. Select logout 3. Wait for logout from system	None	User should logout of application	As expected,	Pass
Post Condition: User returns to Homepage of website and no longer logged in.				

7. ITEM PASS/FAIL CRITERIA

The test process will be completed once the initial set of distributors have successfully sent in reassigned sales data for a period of one month and the new EDI data balances with the old ZIP/FAX data received in parallel. When the sales administration staff is satisfied that the data is correct the initial set of distributors will be set to active and all parallel stopped for those accounts.

8. TEST DELIVERABLES

- Acceptance test plan
- System/Integration test plan
- Unit test plans/turnover documentation
- Screen prototypes
- Report mock-ups
- Defect/Incident reports and summaries
- Test logs and turnover reports

9. STAFFING AND TRAINING NEEDS

For developing the “Locating Shops with Scanned Product Availability” app, there will be a team of 10 test engineers. This will prevent the test project from being delayed due to a lack of personnel. During the system, acceptance, and all major mission critical testing periods, at least three full-time testers should remain on site at all times. The three more test team members might be fresh hires, allowing us to avoid paying them as full-time testers. They can go over the testing procedure, training and learn how to run large-scale tests in order to provide complete and proper testing the following areas need to be addressed in terms of training.

- The developers and tester(s) will need to be trained on the basic operations of the QR Scanning Interface. Prior to final acceptance of the project the operations staff will also require complete training on this technology.
- The team needs to maintain strict documentation to avoid problems later on.
- Navigation system should be handled by the senior engineers as it is quite complex. They need to have prior experience in designing Navigation systems.

10. RESPONSIBILITIES

Responsibility	Name	Role
Verifying Test Plan	Nahidul Islam	Test Lead
Writing Test Case	Samin Mohammed	Test Engineer
Acceptance Test Documentation & Execution	Nahidul Islam	Test Lead
Unit Test Documentation & Execution	Khaled Ahmed	Junior Tester
Validating Project changes	Md. Shihab Hossain	Project Manager
Regression Test and Control Changing	Samin Mohammed, Khaled Ahmed	Test Engineer, Junior Tester
Rules & Procedures	Nahidul Islam, Tahmid Ratul	Test Lead, Junior Developer
Design Reviews	Nahidul Islam, Md. Shihab Hossain, Khaled Ahmed	Test Lead, Project Manager, Junior Tester
Test Documentation & Execution	Samin Mohammed, Khaled Ahmed	Test Engineer, Junior Tester

11. TESTING SCHEDULE

Time has been allocated within the project plan for the following testing activities. The specific dates and times for each activity are defined in the project plan timeline. Coordination of the personnel required for each task, test team, development team, management and customer will be handled by the project manager in conjunction with the development and test team leaders.

Sl.	Task	Duration	Start	Finish
1	Review of Requirement Document	14 days	10-04-2022	24-04-2022
2	Development of Master Test Plan	30 days	25-04-2022	24-05-2022
3	Generating Test Scenarios	16 days	25-05-2022	09-06-2022
4	Test Case Documentation	30 days	10-06-2022	09-07-2022
5	Selecting Test Cases	14 days	10-07-2022	23-07-2022
6	Unit Testing	90 days	24-07-2022	21-10-2022
7	Integration Testing	100 days	22-10-2022	29-01-2023
8	System Testing	60 days	30-01-2023	30-03-2023
9	Acceptance Testing	30 days	31-03-2023	29-04-2023
10	Evaluating Acceptance Criteria	14 days	30-04-2023	13-05-2023

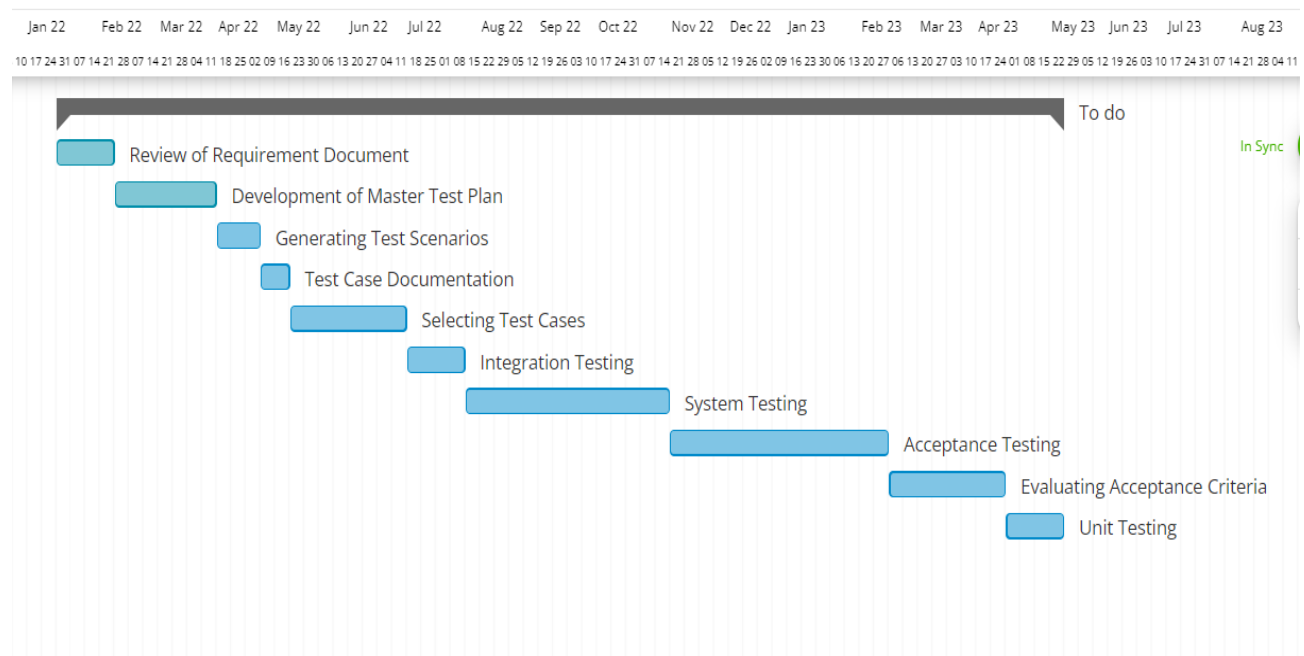


Fig 5: Gantt Chart of the Testing Schedule

12. PLANNING RISKS AND CONTINGENCIES

- Limited Staff: Due to staff shortage there may be delays in getting staff to review appropriate documents and to participate in the Acceptance test process. Should client staff become a problem, the appropriate dates for reviews and acceptance testing will slip accordingly.
- Future Expansion: The software system must be adaptable enough to handle changes and expand its capabilities in the future. Prior agreement will be made for necessary future expansions during maintenance phase.
- Change of Original Requirements: Every feature to be developed should be agreed upon prior to starting development and records should be kept. This will reduce unnecessary change of original requirement. Not doing so may lead to compromises such as working overtime or increasing number of accepted bugs in the system.

13. APPROVALS

Name	Role	Date
Nahidul Islam	Test Lead	19-04-2022
Md. Shihab Hossain	Project Manager	19-04-2022
Samin Mohammed	Test Engineer	19-04-2022
Khaled Ahmed	Junior Tester	19-04-2022
Tahmid Ratul	Junior Developer	19-04-2022
Khaled Ahmed	Junior Tester	19-04-2022

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