AISSMS
COLLEGE OF ENGINEERING
ज्ञानम् सकलजनहिताय
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Affiliated to Savitribai Phule Pune University and recognized 2(f) and 12(B) by UGC
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Laboratory Practical - 4
STQA Mini Project Report

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GROUP MEMBERS

Pratik Pingale 19CO056

AIM

Create Test Cases, Test Case Scenarios, and Negative and Positive test cases for an application.

PROBLEM STATEMENT

Create a small application by selecting the relevant system environment/platform and programming languages. Narrate a concise Test Plan consisting of features to be tested and bug taxonomy. Prepare Test Cases inclusive of Test Procedures for identified Test Scenarios. Perform selective Black-box and White-box testing covering Unit and Integration tests by using suitable Testing tools. Prepare Test Reports based on Test Pass/Fail Criteria and judge the acceptance of the application developed.

Test Cases For Hospital Management System [HMS]

1. Check by entering the correct URL in the browser, and the application should be loading properly
2. Check if is there any user verification functionality present on the application.
3. Check by entering valid credentials like username and password user should be able to log in
4. Check by entering invalid credentials the user should not be login into the application, and an error message should be displayed
5. Check if the hospital management system application has the option to add a new patient
6. Check whether all the mandatory fields are present in the registration portal
7. Check after adding a new patient, and after completion of the payment process, the patient cards should be printed
8. Check whether the patient card has the details like assign doctor name comma department, present application number command date of join and also located bed details, etc
9. Check after completion of the patient checkup process the details should be updated in the patient database
10. Check if the patient exists in the database, and if he performs some checkup then the user should be able to search the details of the present in the database
11. Check if the doctors are also able to update the passenger details after check
12. Check the number of roles in the hospital management system like the patient, doctor, admin, accountant, etc
13. Check that the authorized users can see the doctor's details in the portal like the doctors' timings and fees.
14. Check if there is any functionality to add a new doctor to the hospital management system, for instance, we have added patient details in the database
15. Check whether the admin users can delete doctor and patient information through the hospital management system portal
16. Check whether an accountant user type can calculate the bills for patients by collecting data from different systems.
17. Check after the formation of a bill that should be an option to print the bill or to generate a hard copy of the bill.
18. Check the authorized users have the privilege to check the details report of the patients like day wise
19. Check the admin has all the access.

20. Check that the new patient registration form on the healthcare portal has all of the needed areas for registering a patient, such as blood group or other important information.
21. Ensure that a valid patient id is generated upon patient registration.
22. Patients should be able to see their reports and other information after logging onto the portal with that patient-id.
23. Verify that the patient's details are updated in the patient details database following the health check-up, based on the requirements.
24. Check to see if the system has a super-admin for doctors.
25. Check that each doctor's information, such as their hours, specialty, charge, and the patient they saw, is visible to users.
26. When leaving or entering the hospital, double-check if the doctor's record can be erased from the system.
27. Verify that the system's billing admin generates the charge using data generated from various systems and the patient's unique application number (i.e. Patient Id).
28. Check to see if a hard copy of the bill can be printed when the user prints it.
29. Verify that only authorized users have access to the total day-by-day billing.
30. Check that the hospital's administration has inventory, a room list, and bed management.
31. Check that the administrator has a record of all the equipment, machinery, and medications and that this record is updated whenever they are used or added to the system.
32. Verify that the administration has a record of available rooms and beds and that this record is updated depending on the allocation and departure of patients.
33. Verify that the portal for new patient registration has all the mandatory fields required for registering a patient.
34. Verify that after filling the patient details and successful payment a Patient-Card is printed.
35. Verify that card has information like patient details, doctor assigned, department, the application number, DOJ, bed allocated(if applicable), etc.
36. Verify that after a patient checkup based on the requirement the details are updated in the patient details database.
37. Verify that for existing patients based on the application number of the patient, their records are added/updated in the database.
38. Verify that the system has an admin for doctors as well.
39. Verify that for each doctor’s details like their timings, specialty, fee, patient visited etc is visible to the authorized users.
40. Verify that new details of new doctors can be added to the system.
41. Verify that the details of existing users can be updated in the system.
42. Verify that the doctor’s record can be deleted from the system.

43. Verify the billing admin of the system calculates the bill based on the patient's unique application number from the data generated from different systems.
44. Verify that the hard copy of the bill can be generated by printing the bill.
45. Verify that authorized users can also see total day-wise billing done.
46. Verify the admin for hospital inventory, room, and bed management.
47. Verify that the admin has the record of all the equipment, machines, and medicines, and the same gets updated when used or added to the system.
48. Verify that the admin has a record of rooms and bed availability and the same gets updated based on their allotment and departure to patients.

Various types of Hospital Management Systems [HMS]

- Provider system – to keep track of provider information
- Broker system – To keep track of broker information and calculate commissions
- Member system – To keep track of policyholder information, as well as various plans and their benefits lists, and to create premium bills for policyholders based on their plans.
- Claims system – For submitting and validating claims
- Finance system – To make the required payments to the supplier, member, or broker
- Member Portal – View policyholder information, pay premiums and submit a request for policyholder information changes.
- Provider portal – To display provider information and submit a change request for provider information.
- Broker portal – displays broker information and allows brokers to seek changes to their information.

Testing of Providers system

Sample Test Scenarios and Test cases for providers (doctor/hospital) system

Test Scenario	Test Cases
1. Access to providers system	• Provider system should let us enter, edit and save the provider's data
2. Positive flow System Testing	• It includes scenarios to enter different types of providers, change providers' details, save and inquire about them
3. Negative flow System Testing	• Allows saving provider information with incomplete data, contract's effective date, entering details about existing providers in the system
4. System Integration Testing	• Validate the feed to the member's system, finance system, claim system, and provider portal. Also, validate if the changes from the provider portal are entered into the respective provider's record
5. Positive flow providers portal testing	• Login and view providers' details, claim status, and member details • Make change request to change the name, address, phone number, etc.
6. Negative flow providers portal testing	• View the member details with an invalid ID • Login with invalid credentials
7. Positive flow Broker portal testing	• Login and view details about broker and commission payment • Make a request to change the name, address, phone number, etc.
8. Negative flow Broker portal testing	• It should include scenarios to log in with invalid credentials

Testing of Broker System

Sample Test Scenarios and Test cases for Broker System:

Sr#	Test Scenario	Test Cases
1)	Broker System	• It should be capable of edit, enter and save broker data • Broker commission calculation based on the premium payment details from the member system
2)	Positive Flow System Testing	• Enter, save and edit brokers record for different types of broker • For active brokers calculate the commission by creating a feed file with the respective record for members with a different plan
3)	Negative flow System Testing	• Enter a broker record with incomplete data and save for different types of broker • By creating the feed file with the respective record for members with different plan calculate the commission for the terminated broker • By creating the feed file with the respective record for members with different plan calculate the commission for the invalid broker
4)	System Testing	• To downstream system such as finance system, broker portal and member system validate the feeds • Validate if the changes from broker portal are incorporated in the respective broker record

Testing of Member System

Sample Test Scenarios and Test cases for Member (Patient) System:

Sr#	Test Scenario	Test Cases
1)	Member system	• Enroll, reinstate and terminate a member • Remove and add a dependent • Generate premium bill • Process premium payments
2)	Positive Flow System Testing	• With the current, past, and future effective dates enroll different types of members • Inquire and change members • Produce premium bill for an active member for the following month • Terminate an active member with past, current and future termination dates greater than the effective date • Re-enroll a terminated member with current, past and future effective dates • Reinstate a terminated number
3)	Negative flow System Testing	• With insufficient data enroll a member • For a terminated member produce a premium bill for the following month
4)	System Integration Testing	• Validate the feed to downstream systems such as provider portal, broker portal, finance system, and claim system • Validate if the alterations from member portal are incorporated in the respective member record • Process the payment of premium bill generated with the feed from members portal that has details of payment made

Testing of Claims System

Sample Test Scenarios and Test cases for Claims System:

#	Test Scenarios	Test Cases
1)	Claim System	• Claims in health-care should edit, enter and process claims for a member as well as dependent • For invalid claims, it should throw errors when incorrect data is entered
2)	Positive Flow System Testing	• It should include the scenario to edit, enter and process claims for a member as well as dependent
3)	Negative Flow System Testing	• It should validate and enter a claim with invalid procedure code and diagnosis code • Validate and enter a claim with the inactive provider ID • Validate and enter a claim with a terminated member
4)	System Integration	• It should include a scenario to validate the feed to downstream systems such as provider and finance portal

Testing of Finance System

Sample Test Scenarios and Test cases for Finance System

Sr#	Test Scenarios	Test Cases
1)	Finance System	• Enroll, reinstate and terminate a member
2)	Positive flow system testing	• It should check whether correct account number or address is chosen for the respective member, provider or broker for the payment
3)	Negative flow system testing	• Verify whether payment is done for an invalid member, provider or broker ID by creating a respective record in the feed • Verify whether payment is done for an invalid amount for the member, provider or broker by creating respective records in the feed

Testing for regulatory compliance

Protecting patient sensitive data and health information is an utmost priority for health regulatory bodies. The testing should be done in compliance with such regulatory bodies.

Sample Test Scenarios and Test cases for Regulatory Compliance:

Sr#	Test Scenarios	Test Cases
1)	User's Authentication	• Using verification method to ensure that correct users get a login and deny to others
2)	Information Disclosure	• Authorizing access to information is based on the user's role and patient limitation
3)	Data Transfer	• At all transfer, points ensure that data is encrypted
4)	Audit Trail	• All transactions and all attempts to access data with a proper set of audit trail information are recorded
5)	Sanity Testing related to regulatory body	• Perform sanity testing and verify the encryption of the data is done in particular areas like EPHI (Electronic Protected Health Information)

Performance testing of Healthcare Application

Before preparing test scenarios certain requirement of the system should be considered. For example, healthcare providers (Doctors/Hospitals) provide care 24/7, so the patient check-in software needs to be available at all times. Also, it needs to communicate with insurance companies to validate policy information, send claims and receive remittances. Here, the architecture should define the different components of the system, the protocol to communicate with insurance companies, and how to deploy the system so that it complies 24/7.

As a tester, you need to ensure that the healthcare software system meets the desired load/performance benchmark.

Bug ID	
ID number	**#032**
Tester	Han Solo
Submit Date	01.11.2018
Title	CONTACT FORM - No confirmation message is shown
Bug Overview	
URL	https://healthfalcon.life/contact-us
Summary	The page where the contact form is on does not show any confirmation message after submitting a contact request.
Screenshot	See attached screenshots
Bug Details	
Steps to reproduce	1. Filled out contact form 2. Click on submit 3. The form loaded a while 4. Contact form showed “<empty>”
Expected result	“Thank you for contacting us, we will get in touch shortly”
Actual result	“<empty>”
Description	This bug is of minor severity as the user should know that the system has recorded his/her response. Else the user might resubmit the contact-us form which seems unnecessary.
Environment	
Platform	Macintosh
Operating System	OS X 10.12.0
Browser	Chrome 69.0.3497.100 (Official Build) (64-bit)
Bug tracking	
Assigned To	Chewbacca
Assigned At	01.11.2018
Priority	Medium
Severity	Minor

Bug ID	
ID number	**#323**
Tester	Alex Ron
Submit Date	02.11.2022
Title	FINAL BILL - Total amount is incorrect
Bug Overview	
URL	https://healthfalcon.life/<bill-id>/final-bill
Summary	The page where the final bill is on does not show the correct sum when compared with the sum of all the items from the bill breakdown.
Screenshot	See attached screenshots
Bug Details	
Steps to reproduce	1. Login using patient-id & birth date 2. Click on Menu tab 3. Click on Final Bill section 4. The total amount on the bill is incorrect
Expected result	The total amount should be the same as the sum of all the items from the bill breakdown
Actual result	Total amount on the bill is incorrect
Description	This bug is of critical severity as the user should know that the correct value of the final bill. This is a must-fix bug.
Environment	
Platform	Windows
Operating System	Windows 11 version 22H2
Browser	Chrome 72.1.2213.100 (Official Build) (64-bit)
Bug tracking	
Assigned To	Donald Ross
Assigned At	04.11.2022
Priority	High
Severity	Critical