

SOFTWARE TESTING

Madhuri Satturi

Health Benefits Application

- User stories/requirements for testing
- Static and dynamic testing techniques
- Test conditions, test cases and potential test scripts
- Test design to include white box and black box techniques
- Exploratory testing plans
- Functional test plan or full test plan
- Test effort estimates.
- Testing team roles and resources
- Plan for incident management and reporting
- Key metrics that you plan to measure and report on
- Risk analysis

User Story 1:Employee ID Check

As an employee, my ID has to be linked and verified to compare or match with employee name, department name, address, and dependent information.

Acceptance Criteria:

- Employee ID is matched with the employee information.
- Employee insurance information should display based on employee ID.

Requirements for Testing:

- Display dependent information after correct log in
- Display invalid ID or password if incorrect entry.`

User Story 2 :Employee Health Insurance

As a HR representative, I need an enrollment reminder sent out to the employees that health insurance enrollment is coming soon and should be reviewed.

Acceptance Criteria:

- Notification email sent to employee's company email in October

Requirements for Testing:

- A test email sent to HR's email based on 1st of October calendar date

User Story 3 :Employee Health Insurance Application

As a HR representative, I need to verify that each employee has enrolled or denied coverage

Acceptance Criteria/Requirements for Testing:

- Database showing enrolled, denied or not signed up for coverage

User Story 4: Review and Enroll to healthcare benefits.

As an employee, I want to view my current benefit plan, so that I can review, modify and submit the new enrollment application.

Acceptance Criteria:

- Allow user to update plan.
- Allow user to sign and submit application for enrollment.

Requirements for Testing:

- Display current benefit plan.
- Display sign up enrollment page

User Story 5: Add family member.

As an employee, I want to add family members, so that I can include family members to the healthcare benefits

Acceptance Criteria:

- Allow user to include family members during enrollment.

Requirements Testing:

- Display rates for HMO, PPO, dental and vision for family members.

Static Testing Techniques

The different types of static testing techniques are mentioned below along with the lead personnel

- Informal review: The document for requirements, system designs, code, test plans, and test cases will be lead by Madhuri Satturi
- Walkthroughs: Bhounik Vamalur
- Technical review: All team members
- Inspection: All team members

Dynamic Testing Techniques

The different types of dynamic testing techniques are mentioned below

- Integration Testing: Will be done on the HR database to check with the employee log in process.
- Unit Testing: All team members will conduct on individual modules
- System Testing: All team members

Test Conditions

1. Employees have to confirm the insurance plan and check if all the requirements of the employee are covered.

- This allows employees to make sure, they have opted for the renewal of correct insurance plans, which fits their requirements.
- If the employee is ok with the previous plan they can continue with the same.
- Employee have to know, if they are eligible for the previous year plan.

Test Conditions

2. Employee family members eligibility in the insurance plan.

- Does this insurance plan cover any family member details?
- What information of the family members is required?

Test Conditions

3. Employee verification before the insurance plan is approved for each employee.

- If employee information is incorrect during verification.
- If employee information verified is correct

Test Cases

- What Percentage of the bill is covered under the insurance plan?
Employees make their decision accordingly, in selecting the insurance plan
- Is there a maximum amount limitation per year, to the bills being presented.
Employees make their insurance plan selection accordingly.

Potential Test scripts

When the employee details are not added correctly in the database. The insurance company can call the employer and confirm.

- Insurance company has the details of the employer.
- They can confirm employee details by comparing with the employers data base.

Success criteria: Use different techniques in order to confirm employee details.

White Box Testing Techniques

- Control flow testing – Pick enough path to assure every source statement is executed at least once.
- Statement coverage – Test every possible statement in the code.
- Branch coverage – Check all if-else and conditional loops.
- Dataflow testing – Ensure values are computed and used correctly.

Black Box Testing Techniques

- Decision table testing – Test combination of inputs that produces different results.
- Equivalence partitioning - Divide input data into partitions of equivalent data. Design test cases to cover each partition at least once.
- Boundary value analysis – Design test cases by getting boundary values.
- Error guessing – Generate test cases based on team's prior experience of testing

Exploratory Testing

- Testing Method – an approach where tester involves with learning, designing, executing and recording testing notes – all concurrently.
- Purpose – to uncover information related to risks
- Example - Explore health benefit application across multiple web browsers, so that users have consistent experience.
- Value – Emphasizes on adaptability and empowers a tester to use their skills to discover information freely

Exploratory Testing

Test preparation through 5 stages

1. **A bug Classification :**
Categorize what types of common bugs were found in previous projects
Carry out root cause analysis on issues or faults
2. **Test Charter:**
This test charter helps to determine how the end user could use the health benefit application. Through following suggestions of what to test, what areas needs to be looked or how it can be tested.
3. **Time Box:**
Testers working in pairs at least 90 minutes without interruption.
This time box session can be extended or reduced by 45 minutes.
4. **Review Results:**
Evaluating those defects found during testing, and learning from coverage areas.
5. **Debriefing:**
Whether an additional testing needed. Checking the outcome of compilation output.

Functional Test Plan

The functional test plan will include the following:

1. Functional Test Plan Scope
 1. In Scope – List of functions that are tested
 2. Out of Scope – List of functions that are not tested
2. Assumptions – Team availability, skills, budget limitation
3. Constraints – Time frames, Resources
4. Functional Test Team Roles and Responsibilities – Roles and responsibilities of team member involved in functional testing.
5. Test Cases-Test case with expected results
6. Test Results – Test case results

Test Effort Estimate

- Following factors will be considered for test effort estimate
 - Complexity of the application
 - Core requirements
 - Team knowledge on the subject
 - Previous estimations
 - Resource availability

Test Effort Estimate

- Work Breakdown Structure (WBS) techniques will be used for test effort estimate
 - Break down project into Modules and sub modules.
 - Divide Sub-modules into functionalities and sub functionalities.
 - Determine tasks to complete
 - Estimate duration for each task

Roles and Responsibilities

- Test Manager - Madhuri Satturi
 - Define testing activities for testers
 - Ensure team has all necessary resources
 - Prepare status report of testing activities
 - Update project manager about the progress of testing activities
- Test engineers - Khairullohodja Nasulloev, Suraj Thapa, Terrence Woods
 - Read documents and understand what needs to be tested
 - Develop test cases and prioritize testing activities
 - Execute test cases and report defects
 - Perform regression testing

Plan for Incident Management & Reporting

- An Incident where application or product misbehaves, where it needs further investigation.
- In other words, a formal document where discrepancy occurs between expected result versus actual result.
- For this reason, an Incident Report should include followings:
 - ❑ Defect Summary – To include customer reported
 - ❑ Incident Description; such as expected result versus actual result
 - ❑ Error description/classification
 - ❑ If applicable, screen prints

Key Metrics

The metrics are based on last years enrollment

- The size of the project: Large
- The number of defects found:30
- Location of defects as in line code 5 lines per module
- Percentage of Tests 75% of the system has been tested since 25% of the test hasn't been changed from last years product.
- Impact of defects found: There was a very low impact to the product .

Risk Analysis

- In the case of Health Benefit Application, Risk Analysis helps in two cases. One, measuring probability of component not working. Second, its negative consequence when it does.

Product Risk	Likelihood	Impact	Risk Priority	Mitigation
Employee Improper Log In	2	1	1	Authentication
Family Not Included	1	2	1	Question Option
Insurer Dropping Coverage	1	5	2	More than 1 Insurer
Server Overload during sign up	1	2	3	Alphabetical Sign up during eligible dates