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CIS 623: Software Testing and Quality

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**Capstone Assignment-Test Plan**

# CONTENTS

## PURPOSE

This test plan describes the testing approach, techniques and plans for the Employee insurance plan application.

## PROJECT DESCRIPTION

Xyz company uses a flexible benefits plan, allowing company employees to customer their heal benefit plan based on personal preferences. The benefits application is expected to go live in 3 months. Xyz company's Human Resources department uses a cafeteria-style approach to provide employees with health care benefits. Each September, employees review their current benefits, modify their elections and then sign election forms. Any changes must be entered and tracked in the benefits application. For medical insurance, an employee enrolls with a preferred provider organization (PPO) or health maintenance organization (HMO). The company currently pays the monthly medical premiums for its employees. However, if an employee enrolls in a dental plan or vision plan, the employee pays a modest monthly premium for the optional plan. An employee may carry medical, dental, and/or vision coverage for one or more of his or her family members. In order to carry insurance on a family member, the employee must carry the same coverage. For example, to carry dental insurance on a spouse, the employee must also carry dental insurance on him or herself.

The benefits application must track employee information like employee ID, department ID, name, address information and office extension number. It must also track information about each insurance company to include the company number and company name. Dependent information and their relationship to the insured employee must also be tracked. An employee must be able to request an enrollment form, and Human Resources must be able to update the effective date of the health benefits on the form. In addition, the application must track the health care benefits rates for PPO and HMO, plus dental and vision rates. Benefits rates differ by employee only, employee + spouse, employee + spouse + one child, and employee + family.

## STATIC TESTING TECHNIQUES

**Informal review:**
It involves buddy checking, paring and pair review. Main goal is to detect potential defects. Additional purpose includes, generating new ideas, new solutions, to solve minor problems. This is performed by the authors, colleague and may not involve any review meeting. Results will not be documented.

**Walkthrough:**
Main purposes are to find defects, improve the software product, consider alternative implementations, evaluate conformance to standards and specifications. Potential defect logs and review reports are produced.

**Technical review**:
Main goal is to gaining consensus, detecting potential defects. Potential defect logs and review reports are produced.

**Inspection**: Main purposes include detecting potential defects, evaluating quality and building confidence in the work product, preventing future similar defects and root cause analysis. Follows a defined process with formal documented outputs, based on rules and checklists. Uses clearly defined roles, and may include a

dedicated reader, Scribe is mandatory, trained facilitator. Individual preparation before the review meeting is required. Specified entry and exit criteria are used. Potential defect logs and review report are produced. Metrics are collected and used to improve the entire software development process, including the inspection process

There are two categories of dynamic testing-White Box Testing and Black Box testing.

**White Box testing**: In this technique the tester has the knowledge of the internal system of the application that is being tested. The aim of the testing to check the performance of the application based on the code which is out of scope for this project. The focus will be on the black box testing.

**Blackbox Testing:** The main aim to check the functionality of the application and the internal design is not known to the tester and

There are two types of Blackbox testing:

- Functional Testing
- Nonfunctional testing.

Functional Testing: Functional testing is performed to verify that all the features developed are according to the functional specifications, and it is performed by executing the functional test cases written.

**Exploratory testing**

The purpose of this test is to make sure critical defects are removed before the next levels of testing can start. The exploratory testing is carried out in the application without any test scripts and documentation by the testing team before the start of each iteration.

**Functional Test**

Functional testing will be performed to check the functions of application. The functional testing is carried out by feeding the input and validates the output from the application. Testing Team will complete the functional test. The test will be performed according to Functional scripts.

**System testing** – This is the type of testing is done after the code has been built and this covers the entire application in terms of testing. The testing team does thorough testing to make sure the functionality of the system is in-line with the requirements.

**Integration testing** – This is a joint effort by the QA and development teams to make sure each individual module (after being tested) then connected to other modules or systems is still working as expected. This is basically the testing for the entire workflow from start to end.

**User Acceptance Testing (UAT)** – This is done by the UAT team (User Acceptance Testing) with the aid of QA team. The business users write their own test cases and perform testing more geared towards the user's perspective unlike what the QA does, more toward system's perspective.

**Requirement Description**

**Each September employee review the benefit plan, modify the selection and sign electronic form. Any change must be entered and tracked.**

| SNo | User Story | Acceptance Criteria |
|---|---|---|
| 1 | As a tester, I want to login on the application as a human resource, so that I can get access to the application. | Given that I am a registered HR employee user, when I enter the user's name and password and click on sign in, then I am successfully logged in with the credentials. |
| 2 | As a tester, I want to login on the application as a human resource, so that the system can authenticate me and I can trust it. | Given that I am a registered HR employee user and logged out, if I go to the log in page and enter my username but an incorrect password and click on Log in, then log in fails with an error message that specifies that the username or password was wrong. |
| 3 | As a tester, I want to login on the application as a human resource, so that I can get access to all the employee's insurance data. | Given that I am a registered HR employee user, when I enter the username password and click sign in, then I should be able to access the employee's data. |
| 4 | As a tester, I want to login as an employee so that I can access my account. | Given that I am a registered user, when I enter the user's name and password and click on sign in, then I am successfully logged in with the credentials. |
| 5 | As a tester, I want to login on the application as an employee, so that I can get access to all the account's insurance data. | Given that I am a registered user, when I enter the username, password and click sign in, then I should be able to access the registered users account data. |

**Requirement Description**

**For medical insurance, an employee enrolls with a preferred provider organization (PPO) or health maintenance organization (HMO). The company currently pays the monthly medical premiums for its employees**

| S No | User Story | Acceptance Criteria |
|---|---|---|
| 6 | As a tester, I want to enroll with Preferred provider organization (PPO) for medical insurance, so that the company can pay the monthly premium. | Given That I am a registered employee, when I enroll for medical insurance with PPO, then I am paid by the employer for the employee medical insurance benefit. |

| 7 | As a tester, I want to enroll with Health Maintenance Organization (HMO) for medical insurance, so that the company can pay the monthly premium for the employee. | Given That I am a registered employee, when I enroll for medical insurance with HMO, then I am paid by the employer for the employee medical insurance benefit. |
|---|---|---|
| 8 | As a tester, I want to login on the application as a human resource, so that I can get access to all the employees' medical insurance data for PMO and HMO. | Given that I am a registered HR employee, when I sign into the account, then I must be able to access all the employee's data who opted medical insurance for PMO or HMO. |

**Requirement Description**

**If an employee enrolls in a dental plan or vision plan, the employee pays a modest monthly premium for the optional plan.**

| S No | User Story | Acceptance Criteria |
|---|---|---|
| 9 | As a tester, I want to enroll for dental plan along with the medical insurance, so that I can be get the dental coverage and know my monthly premium amount. | Given that I am registered employee, when I enroll for medical insurance and opt for additional dental plan, then I should be able to see that I get the benefits and see my monthly contribution as a premium amount. |
| 10 | As a tester, I want to enroll for vision plan along with the medical insurance, so that I can be get the dental coverage and know my monthly premium amount. | Given that I am registered employee, when I enroll for medical insurance and opt for additional vision plan, then I should be able to see that I get the benefits and see my monthly contribution as a premium amount. |
| 11 | As a tester, I want to enroll for dental and vision plan along with the medical insurance, so that I can be get the dental coverage and know my monthly premium amount. | Given that I am registered employee, when I enroll for medical insurance and opt for additional dental and vision plan, then I should be able to see that I get the benefits and see my monthly contribution as a premium amount. |
| 12 | As a tester, I want to login as a human resource so that I can access the employee list who opted for vision or dental or both the coverage for themselves. | Given that I am a registered HR employee, when I login into the application, then I should be able to access the employee data who opted for dental or vision or both for themselves along with the medical insurance. |

**Requirement Description**

**An employee may carry medical, dental, and/or vision coverage for one or more of his or her family members. In order to carry insurance on a family member, the employee must carry the same coverage. For example, to carry dental insurance on a spouse, the employee must also carry dental insurance on him or herself.**

| | User Story | Acceptance Criteria |
|---|---|---|

| 13 | As a tester, I want to login as an employee and enroll for dental coverage along with the medical insurance for the spouse, so that both persons are covered and displays the monthly premium. | Given that I am a registered employee, when I enroll the spouse for dental insurance and medical insurance, then I should be able to see that both the persons are enrolled and the monthly premium amount is displayed accordingly. |
|---|---|---|
| 14 | As a tester, I want to login as an employee and enroll for vision coverage along with the medical insurance for the spouse so that both persons get same coverage and can see the monthly premium charges. | Given that I am a registered employee, when I enroll the spouse for dental insurance and medical insurance, then I should be able to see that both the persons are enrolled and the monthly premium amount is displayed accordingly. |
| 15 | As a tester, I want to login as an employee and enroll for dental and vision coverage along with the medical insurance for the spouse so that both persons get same coverage. | Given that I am a registered employee, when I enroll the spouse for dental and vision coverage along with medical insurance, then I should be able to see that both the persons are getting all the insurance and the monthly premium displayed accordingly. |
| 16 | As a tester, I want to login as an employee and enroll for dental coverage along with the medical insurance for the spouse and child, so that all the family members are covered with the same insurance policy. | Given that I am a registered employee, when I enroll the spouse and child for dental and medical insurance, then I should be able to see that all the family members are covered with the same insurance policy and the monthly premium amount is displayed accordingly. |
| 17 | As a tester, I want to login as an employee and enroll for vision coverage along with the medical insurance for the spouse and child, so that all members of the family get same coverage. | Given that I am a registered employee, when I enroll the spouse and child for vision insurance and medical insurance, then I should be able to see that all members of the family get same coverage and the monthly premium amount is displayed accordingly. |
| 18 | As a tester, I want to login as an employee and enroll for dental and vision coverage along with the medical insurance for the spouse and child, so that all members of the family get same coverage. | Given that I am a registered employee, when I enroll the spouse and child for dental and vision coverage along with medical insurance, then I should be able to see that all members of the family get same coverage and the monthly premium amount is displayed accordingly. |
| 19 | As a tester, I want to login as a human resource and filter the data, so that I can access the employee data who enrolled the spouse for dental or vision or both along with the medical insurance. | Given that I am a registered HR employee, when I access the application, then I should be able to filter the data about the employees who have enrolled their spouse for dental, medical or both along with the medical insurance. |
| 20 | As a tester, I want to login as a human resource and filter the data, so that I can access the employee data who enrolled the spouse and | Given that I am a registered HR employee, when I access the application, then I should be able to filter the data about the employees who have enrolled |

| | child for dental or vision or both along with the medical insurance. | their spouse and child for dental, vision or both the insurance along with the medical insurance. |
|---|---|---|

**Requirement Description**

**The benefits application must track employee information like employee ID, department ID, name, address information and office extension number. It must also track information about each insurance company to include the company number and company name. Dependent information and their relationship to the insured employee must also be tracked.**

| SNo | User Story | Acceptance Criteria |
|---|---|---|
| 23 | As a tester I want to access the application as a registered employee, so that I can include the insurance company information. | Given that I am a registered employee, when I access the application, then I should be able to update the insurance company name. |
| 24 | As a tester, I want to logon as a registered HR employee and access employee insurance company so that I can include the company name and company number. | Given that I am a registered HR employee, when I access the application, then I should be able to track information about each insurance company to include the company number and company name. |
| 25 | As a tester, I want to logon as a registered HR employee, so that I can access all the employee information like employee ID, department ID, name, address and office extension number | Given that I am a registered HR employee, when I access the application, then I should be able to access employee information and rely on the application that information when needed is available. |
| 26 | As a tester, I want to login as a registered employee and update my application, so that I can include my spouse as dependent. | Given that I am a registered HR employee, when I access the application, then I should be able to access the employee's dependent information. |
| 27 | As a tester, I want to login as a registered employee and update my application, so that I can include my spouse and child as dependent. | Given that I am a registered HR employee, when I access the application, then I should be able to access the employee's spouse and child dependent information. |
| 28 | As a tester, I want to a login as a database engineer to access the employee insurance database, so that I can run on some sql queries. | Given that I am a tester logged in as a database engineer, then I should be able to access the employee insurance database to run the sql queries. |

**Requirement Description**

**An employee must be able to request an enrollment form, and Human Resources must be able to update the effective date of the health benefits on the form.**

| SNo | User Story | Acceptance Criteria |
|---|---|---|
| 29 | As a tester, I want to login as a registered employee any time during the year, so that I can request an enrollment form. | Given that I am a registered employee, when I access the application, then I can request an enrollment form any time of the year. |

| 30 | As a tester, I want to login as a registered employee so that I can update any new information on the enrolment form. | Given that I am a registered employee, when I login as an employee any time then I should be able to update any changes on my enrolled form. |
| --- | --- | --- |
| 31. | As a tester, I want to login as a registered HR employee so that I can look for the changes that are made and update the effective date of the health benefits on the form. | Given that I am a registered HR employee, when I access the application and see the changes made by the employee then I should be able to update the effective date of the health benefits. |

**Requirement Description**

**The application must track the health care benefits rates for PPO and HMO, plus dental and vision rates. Benefits rates differ by employee only, employee + spouse, employee + spouse + one child, and employee + family.**

| SNo | User Story | Acceptance Criteria |
| --- | --- | --- |
| 32 | As a tester, I want to login as a registered employee so that I can see the benefit rates for the medical, dental and vision after updating my spouse and child information. | Given that I am a registered user, then I should login and update the spouse and child information so that I can see the updated charges for the benefit package. |
| 33 | As a tester, I want to login on the application as a human resource, so that I can filter the data and see the health care benefit rates for PPO and HMO, plus dental and vision rates which differ by employee only, employee + spouse, employee + spouse + one child, and employee + family. | Given that I am a registered HR employee, then I should access the application any time so that I can get the data on the health care benefits based on the employee and dependent registrations. |
| 34 | As a tester I want to login and access the employee insurance database as a database engineer, so that I can query the database for health care benefit rates for PPO and HMO, plus dental and vision rates which differ by employee only, employee + spouse, employee + spouse + one child, and employee + family. | Given that I am a registered database engineer, then want to access the database anytime so that I can get the data on the health care benefits based on the employee and dependent registrations. |

PURPOSE: Functional testing will be performed to check the functions of application. The functional testing is carried out by feeding the input and validates the output from the application.

Scope: The scope of the functional test is to determine the major functionality of the application, which includes

- Login page
- Add and Update information
- Request form
- Select Different Plans
- Filter data by the Human resource
- Database Functionality

## TEST CONDITIONS

| S. No | Test Condition | Requirement Traceability |
|---|---|---|
| 1. | The application should launch only on the company's website | Each September employee review the benefit plan, modify the selection and sign electronic form. Any change must be entered and tracked. |
| 2 | The application should accept the employee number and the password for the login credentials. | |
| 3 | The application should let the employee login and HR login separately. | |
| 4 | After three attempts of login failure the employee should be able to request for the password reset link. | |
| 5 | The application should have all data saved in for the employee, so that it can be viewed by anytime by the employee and HR. | |
| 6 | The employee should be able to enroll with a preferred provider organization for the medical insurance. | For medical insurance, an employee enrolls with a preferred provider organization (PPO) or health maintenance organization (HMO). The company currently pays the monthly medical premiums for its employees |
| 7 | The employee should be able to enroll with a health maintenance organization (HMO) for the medical insurance. | |
| 8 | The company pays the medical insurance for the employee, and the application should display zero premium charges for employee only, medical insurance plan. | |
| 9 | The company pays the medical insurance for the employee, and the application should display zero premium charges for employee only, medical insurance plan. | |
| 10 | Once signed in as employee, the application should provide options to enroll for dental or vision or both. | If an employee enrolls in a dental plan or vision plan, the employee pays a modest |
| 11 | Once employee is signed in, after enrolling for the PPO or PMO, if dental plan is selected the application should display the premium that the employee should pay. | |

| 12 | Once employee is signed in, after enrolling for the PPO or PMO, if vision plan is selected the application should display the premium that the employee should pay. | monthly premium for the optional plan. |
|---|---|---|
| 13 | Once employee is signed in, after enrolling for the PPO or PMO, if dental and vision plans are selected the application should display the premium that the employee should pay. | |
| 14 | The HR when signed in should be able to filter employees who have enrolled for dental, vision or both along with the medical insurance. | |
| 15 | Once the employee enrolls a spouse, child or family member for dental and medical coverage, the application should inform the employee to enroll for the same plan like the family members | An employee may carry medical, dental, and/or vision coverage for one or more of his or her family members. In order to carry insurance on a family member, the employee must carry the same coverage. For example, to carry dental insurance on a spouse, the employee must also carry dental insurance on him or herself. |
| 16 | Once the employee enrolls a child and spouse for medical and vision insurance, the application should enroll the employee for the same plan and display the charges | |
| 17 | After the employee enrolls for medical, dental and vision plan, for the whole family members the application should display the monthly premium charges the employee has to contribute | |
| 18 | A HR should be able to filter or find employees based on the coverage plans that they have subscribed along with the dependents. | |
| 19 | Application should let the employee fill/update all the information like employeeID, department Id, name, address and office extension number before submitting the form | The benefits application must track employee information like employee ID, department ID, name, address information and office extension number. It must also track information about each insurance company to include the company number and company name. Dependent information and their relationship to the insured employee must also be tracked. |
| 20 | When the HR is logged in, the application should help them pull all the information like employeeID, department Id, name, address and office extension number about the employee enrolled for any medical plan. | |
| 21 | The HR should use the application to update the insurance company number and name the employee opted for. | |
| 22 | The application must let the employee enroll the spouse, child and other family members for the insurance plan as dependents. | |
| 23 | The application should allow the HR to filter the dependent information if needed from using the employee ID when needed. | |
| 24 | The database for the employee insurance should yield all the information if queried for any information. | |
| 25 | The employee once logged in, should have the option to request for the enrollment form any time of the year. | An employee must be able to request an enrollment form, and Human Resources must be able to update the effective |
| 26 | HR must be able to update the effective date of the health benefit form once logged in. | |

| | | | | | | date of the health benefits on the form. |
|---|---|---|---|---|---|---|

A total of sixteen test cases with the test scripts and test data are attached in the below excel sheet.

TestCase_TestData.xlsx



TestCase_TestData.xlsx

Based on the requirements, there are certain requirements that the application should perform -

- Updating or Saving the Employee ID, Department ID, Employee Name, Address, and Office Extension number, so that it can be tracked and retrieved.
- The application should track the PPO or HMO insurance company, so the name and the company number can be updated.
- The application must track the dependent information like the name, age and gender and their relationship with the employee so that they can be retrieved and used for further.
- The application must also track the health care benefit rates, which differ by the plan type and dependent choices.

Based on the requirement the following table has been created to understand the benefit plans.

X – The choice could be made by the employee or the possibility of making the choices.

| | | Employee Only | Employee and spouse | Employee and spouse and child | Employee and Family |
|---|---|---|---|---|---|
| S:NO | Medical Plan Types | | | | |
| 1 | Medical PPO | × | × | × | × |
| 2 | Medical HMO | × | × | × | × |
| 3 | Medical PPO + Dental Plan | × | × | × | × |
| 4 | Medical HMO+Dental Plan | × | × | × | × |
| 5 | Medical PPO + Vision Plan | × | × | × | × |
| 6 | Medical HMO+ vision Plan | × | × | × | × |
| 7 | Medical PPO+ Dental + vision plan | × | × | × | × |
| 8 | Medical HMO+ Dental + vision plan | × | × | × | × |
| 9 | No benefit plan - PPO | × | × | × | × |
| 10 | No benefit plan - HMO | × | × | × | × |

Boundary Value analysis cannot be done for this scenario because there are no boundaries and each set of combinations for the employee, insurance benefits and dependents are unique scenarios and they will be considered only on the equivalence partitioner.

EQUIVALENCE PARTITIONING:

Based the requirements there are 43 testcases that are unique to the situations which need to be tested. Employee's login and the partitions

| TestCase | Scenarios | Expected Outcome |
|---|---|---|
| 1 | Medical PPO Employee Only | Company pay premium |
| 2 | Medical HMO Employee Only | Company pay premium |
| 3 | Medical PPO + Dental Plan Employee Only | Employee and company pay premium |
| 4 | Medical HMO+Dental Plan Employee Only | Employee and company pay premium |
| 5 | Medical PPO + Vision Plan Employee Only | Employee and company pay premium |
| 6 | Medical HMO+ vision Plan Employee Only | Employee and company pay premium |
| 7 | Medical PPO+ Dental + vision plan Employee Only | Employee and company pay premium |
| 8 | Medical HMO+ Dental + vision plan Employee Only | Employee and company pay premium |
| 11 | Medical PPO   Employee and spouse | Employee and company pay premium |
| 12 | Medical HMO   Employee and spouse | Employee and company pay premium |
| 13 | Medical PPO + Dental Plan   Employee and spouse | Employee and company pay premium |
| 14 | Medical HMO+Dental Plan    Employee and spouse | Employee and company pay premium |
| 15 | Medical PPO + Vision Plan   Employee and spouse | Employee and company pay premium |
| 16 | Medical HMO+ vision Plan   Employee and spouse | Employee and company pay premium |
| 17 | Medical PPO+ Dental + vision plan   Employee and spouse | Employee and company pay premium |
| 18 | Medical HMO+ Dental + vision plan   Employee and spouse | Employee and company pay premium |
| 19 | Medical PPO Employee and spouse and child | Employee and company pay premium |
| 20 | Medical HMO Employee and spouse and child | Employee and company pay premium |
| 21 | Medical PPO + Dental Plan Employee and spouse and child | Employee and company pay premium |
| 22 | Medical HMO+Dental Plan Employee and spouse and child | Employee and company pay premium |
| 23 | Medical PPO + Vision Plan Employee and spouse and child | Employee and company pay premium |
| 24 | Medical HMO+ vision Plan Employee and spouse and child | Employee and company pay premium |
| 25 | Medical PPO+ Dental + vision plan Employee and spouse and child | Employee and company pay premium |
| 26 | Medical HMO+ Dental + vision plan Employee and spouse and child | Employee and company pay premium |
| 27 | Medical PPO Employee and Family | Employee and company pay premium |
| 28 | Medical HMO Employee and Family | Employee and company pay premium |
| 29 | Medical PPO + Dental Plan Employee and Family | Employee and company pay premium |
| 30 | Medical HMO+Dental Plan Employee and Family | Employee and company pay premium |
| 31 | Medical PPO + Vision Plan Employee and Family | Employee and company pay premium |
| 32 | Medical HMO+ vision Plan Employee and Family | Employee and company pay premium |
| 33 | Medical PPO+ Dental + vision plan Employee and Family | Employee and company pay premium |
| 34 | Medical HMO+ Dental + vision plan Employee and Family | Employee and company pay premium |
| 35 | No benefit plan - PPO /dental/vision Employee and Family | No premium contributions |
| 36 | No benefit plan - HMO/dental/vision Employee and Family | No premium contributions |

**Equivalence Partitioning:**

| Test Cases | Scenarios | Expected outcome |
| --- | --- | --- |
| 37 | Employee Login – valid data | Employee Gain access to insurance page |
| 38 | HR login -Valid Data | Human Resource gain access to the application |
| 40 | Filter data | Human Resource must be able to filter employee's data based on the selection |
| 41 | Update Effective Date | Human Resource must be able to update the effective date for the employee form |
| 42 | Request Form | Employee should request and fill out the form any time of the year |
| 43 | Login Attempt-Invalid data | After three failures a password reset mut be initiated. |

**Table below is considered for the decision table regarding the rules on processing application.**

**Table 1 and its legend below:**

| | E | | | E+S | | | E+S+C | | | | E+F | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
| Employee medical-HMO or PPO | T | T | F | T | T | T | T | T | T | T | T | T | T | T | T |
| Employee Dental | F | T | F | F | F | T | F | F | T | T | T | F | F | F | T |
| Employee Vision | F | T | F | F | T | T | F | T | T | T | F | F | T | F | T |
| | | | | | | | | | | | | | | | |
| Spouse medical | _ | _ | _ | T | T | T | F | T | T | F | _ | _ | _ | _ | |
| Spouse Dental | _ | _ | _ | F | F | T | F | F | F | F | _ | _ | _ | _ | |
| Spouse Vision | _ | _ | _ | T | T | T | T | F | T | F | _ | _ | _ | _ | |
| | | | | | | | | | | | | | | | |
| Child Medical | _ | _ | _ | _ | _ | _ | T | T | T | T | _ | _ | _ | _ | |
| Child Dental | _ | _ | _ | _ | _ | _ | F | F | T | F | _ | _ | _ | _ | |
| Child Vision | _ | _ | _ | _ | _ | _ | T | T | F | T | _ | _ | _ | _ | |
| | | | | | | | | | | | | | | | |
| Family Medical | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | T | T | T | T | T |
| Family dental | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | T | T | F | F | T |
| Family vision | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | F | F | T | T | T |
| | | | | | | | | | | | | | | | |
| OUTCOME | | | | | | | | | | | | | | | |
| Company contributes | Yes | Yes | NA | NA | Yes | Yes | NA | Yes | Yes | Yes | Yes | NA | Yes | NA | Yes |
| Employee contributes | No | Yes | NA | NA | Yes | Yes | NA | Yes | Yes | Yes | Yes | NA | Yes | NA | Yes |
| Insurance Accepted | Yes | Yes | No | No | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | No | Yes |

| Legends | | Legends | |
|---|---|---|---|
| R1… | Rule 1 till last rule | E | Employee only |
| T | TRUE | E+S | Employee + Spouse |
| F | FALSE | E+S+C | Employee + Spouse+ one child |
| - | Not considered for scenario | E+F | Employee Family |
| NA | Not Applicable | | |

Test Cases Based on the Decision Table:

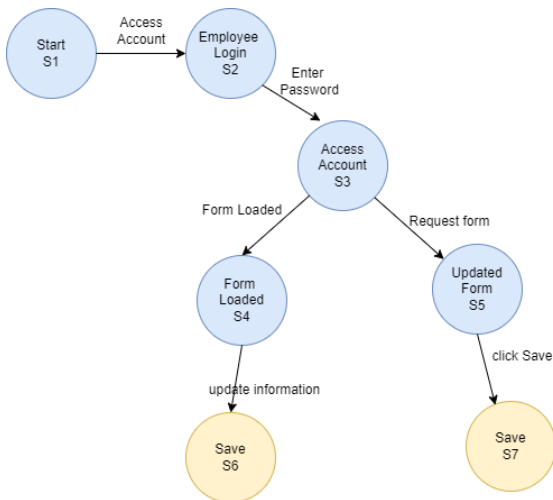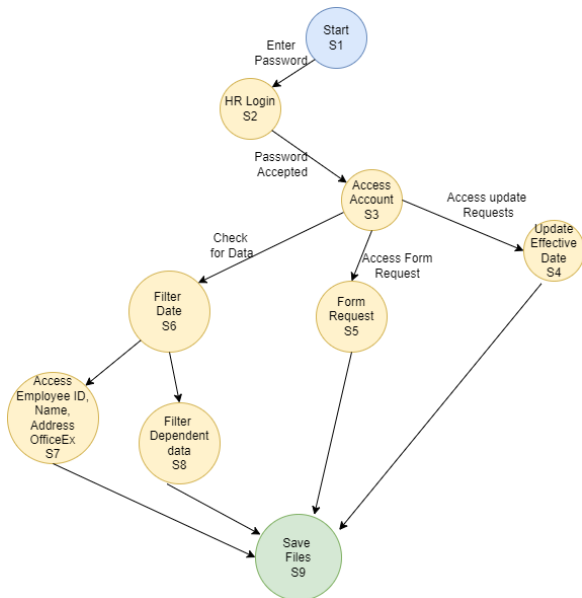| TC | Input | outcome |
|---|---|---|
| 1 | Employee Sara opts for medical insurance | Application accepted and company contributes for the insurance |
| 2 | Employee Adam opts for Medical Insurance and benefits - dental and vision | Application accepted. Along with the company contribution employee pays the nominal premium amount |
| 3 | Employee Baily opts for medical insurance for herself and spouse. Additionally, she enrolls her spouse on vision plan | Application Rejected. In order to carry benefits for the family members the applicant should also carry the same. In our case as per the rule 4, Baily should also subscribe for vision plan. |
| 4 | Employee Megan opts medical and vision for herself and spouse. | Application accepted. According to rule 5, along with the company contribution employee pays the nominal premium amount |
| 5 | Employee Tom enrolls himself for medical plan, his spouse for Vision and his child for medical and vision. | Application rejected as per rule 7. The employee has to have medical and vision on him to take those plans for the spouse and child. |
| 6 | Employee Mike enrolls himself for all three plans, his spouse for medical and vision, his child for Medical and dental. | Application accepted, as per rule 9, because employee have subscribed for all three benefits and opted few for his family members. |
| 7 | Employee Eugene enrolls for medical insurance and opts for medical and dental plan for her family | Application rejected as per rule 14. The employee has to have medical and dental on him to take those plans for the spouse and child. |
| 8 | Employee Rider opts for all the benefits for him and his family | Application accepted as per rule 16. Employee pays the monthly premium along with the monthly contribution from company. |

Login Transition:
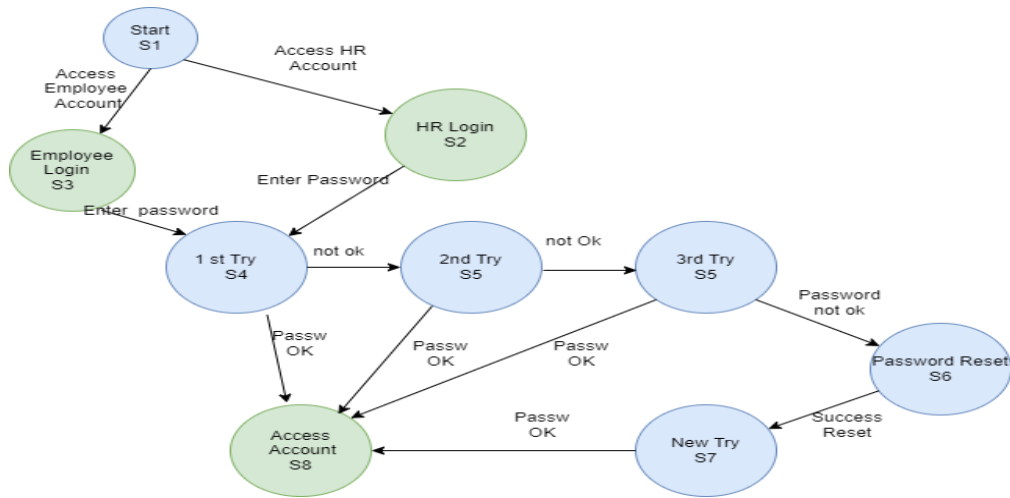


| State | Event | Test Cases | Expected Outcome |
|-------|-------|-----------|------------------|
| S1 | Start | Launch the application on the company website | Application Should Launch |
| S2 | HR Login | Launch the application and click on the HR login button | New Page opens up |
| S3 | Employee Login | Launch the application and click on the Employee Login Button | New Page opens up to enter the employee login and password |
| S4 | First login Try | After launching the application and selecting login, enter invalid password | Enter the employee ID as the login and the password, invalid |
| S5 | Second Try | The application should ask for login details again, enter invalid password | Enter the employee ID as the login and the password, invalid |
| S5 | Third Try | Application will ask for login details for the third time, enter invalid password | The application should display a password reset message |
| S6 | Password Reset | After attempting to login for three times, the password rest link appears. Click on the link and enter the new password. | After entering the new password, the application should go back to login page |
| S7 | New Try | After password reset, enter the employee ID and the new password | The application should accept the credentials. |
| S8 | Access Account | After entering the valid user id and password, click enter | The Insurance account page should open for the employee |

Employee Login:

Start S1 — Access Account → Employee Login S2 — Enter Password → Access Account S3

Access Account S3 — Form Loaded → Form Loaded S4

Access Account S3 — Request form → Updated Form S5

Form Loaded S4 — update information → Save S6

Updated Form S5 — click Save → Save S7

| State | Event | Test Cases | Expected Outcome |
| --- | --- | --- | --- |
| S1 | Launch Application | Launch the application on the company website | Application Should Launch |
| S2 | Employee login | Launch the application and click on the Employee login button | New Page opens up |
| S3 | Access Account | Enter the user Id and the password to gain access | New Page opens up to enter the employee login and password |
| S4 | Form Loaded | The Employee can access the insurance form | The Employee must have access to insurance form any time of the year |
| S5 | Request Form | The employee should request a form | The employee should be able to request the form any time of the year |
| S6 | update Information and Save | Enter the new information on the form or update the old information. | After completing the information, the application should update the new information |
| S7 | Save | Save | The application should save the information. |

HR Access:



| State | Event | Test Cases | Expected Outcome |
|-------|-------|-----------|------------------|
| S1 | Launch Application | Launch the application on the company website | Application Should Launch |
| S2 | HR Login | Launch the application and click on the HR login button | New Page opens up |
| S3 | Access Account | Enter the user Id and the password to gain access | New Page opens up to enter the HR employee login and password |
| S4 | Update effective Date | After launching and accessing the account, update the effective date for the new or updated insurance requests. | The application should accept the updated effective dates for the employees. |
| S5 | Form Request Approval | After launching and accessing the account, update the form request approval for the employees who have requested for the insurance form. | The application should allow the HR to approve the requests for form. |
| S6 | Filter data | After Launching, the HR must select the drop down to filter the data | The HR should be able to filter and extract data using the application using the drop-down options. |
| S7 | Access Employee Data | Upon gaining access to the account, the employee information like, id, name, address, division should be accessible | The HR should have access to filter the employee information |
| S8 | Access Dependent Data | Upon gaining access to the account, the dependent information should be accessible. | The HR should have the access to filter the dependent information |
| S9 | Save Action | Any changes must be saved. | The application should save the information. |

Exploratory testers design a test, execute it immediately, observe the results, and use results to design the next test. Because tester is not bound by the test case steps, exploratory testing help find important defects faster. It allows to cover more ground and focus on testing the "what ifs. (Totenberg, Jan 29,2020)

Exploratory testing doesn't have a script, it follows certain guided principles, that will help accomplish the work withing the project scope.

The Expected bugs are classified based on the previous experience.

- Some of them include, Input fields with long names, special characters, numbers, nulls.
- Checking on the date picker functionality and its future dates.
- String checks like space, delimiters, long strings, blanks will be checked.
- Input methods-typing, copy paste, drag etc.
- Undo and redo, going back and forward will be checked.

Test charter

- Testing the login functionality.
- Checking the account update functionality
- Checking on the date pickers.
- Selecting medical plans and benefits like vision and dental for all the combinations like-employee, employee spouse, child and family. This is done to check if the selections and the rates are getting updated accordingly.
- Check if the HR logging is able to update information- dates, strings etc.
- The HR login should be able to filter the data when needed.
- Testing will be done in the designated area so that no one will disturb the testers.

Time Box:

- Two testers work together for at least 90 minutes.
- Interruptions do not occur during the 90 minutes.
- An extension or reduction of 45 minutes is acceptable.
- Testers react to the response of the application and prepare for the correct outcome.

Review the results.

- Assess the defects.
- Learn from the test.
- Analyze coverage areas.

Debrief.

- Compile results.
- Compare results to the character.

Entry Criteria:

- The requirement data should be available
- Test plan document ready
- Complete understanding of the requirement
- Test environment should be ready
- Application will be tested on the chrome browser.

Exit Criteria:

- All the defects must be fixed and retested.
- All the Testcases must be executed, documented, retest the failed cases.
- Regression test must be completed.
- All the quality characteristics must be meet by testing the features of the application.
- All problems must be resolved with a permanent fix and that all testcases be run successfully with the fixes in place.

## TEST EFFORT ESTIMATES

Based on the requirements and the number of testcases designed, the time it takes to complete the testing can be estimated. While estimating the efforts it is always good to consider some buffer time, resources availability, past experience and allow room to accommodate any changes as the project progress.

**Work Breakdown Structure:**

Software and testing training YouTube discusses on how to break down the testing effort. It involves four steps viz., divide the whole project into small tasks, allocate tasks to each team members, calculate the effort estimation and validate them. Based on this approach work breakdown structure will be followed for our parking lot calculation application scenario.

| Task | Usage Notes | Cumulative Hours | Total Cumulative Hours. |
|------|-------------|------------------|-------------------------|
| Application KT | Existing application familiarization /Orientation/KT for the team | T1=3 | 3 |
| Static Testing | Peer review and updates | T2=T1+5 | 8 |
| Reporting | Test lead/Coordination/status reporting efforts | T3=T2+5 | 13 |
| Test Environment preparation | Estimation is based on the hardware, software installation and deployment builds | T4=T3+3 | 16 |
| Testing of n requirements | If there are n (example 100) requirements, each takes 1/2 hour | T5=T4+50 | 66 |
| Exploratory requirement | Use 20 %extra time per requirement | T6=T5+(50*0.2=10) | 76 |
| Re-testing, requirement changes /corrections | Use 20 % extra tie per requirement (approximation) | T7=T6+(50*0.2=10) | 86 |
| Logging defects/ retesting fixes | For 20 defects say 30 minutes | T8=T7+((0.30*20=10) | 96 |
| Regression testing | For 100 requirements a total of 10 hours | T9=t8+10 | 106 |
| Reserve | Buffer time for unexpected incidents | T10=t9+5 | 111 |
| Communication | Meetings and other communications with stakeholders, developers, BA's | T11=t10+10 | 121 |
| UAT | supporting the and testing | T12=t11+20 | 141 |
| Post Production support | Supporting end users | T13=T12+30 | 171 |
| Total Efforts (hours) | | TOTAL | 171 |
| Total Efforts in days | | 9hours/day | 19 |

The following list defines in general terms the expectations related to the roles directly involved in the management, planning or execution of the test for the project.

| SN0. | Roles | Responsibilities |
|---|---|---|
| 1 | Project Manager | Reviews the content of the Test Plan, Test Strategy and Test Estimates signs off on it. |
| 2 | Test Lead | Develops test plan, design and strategy, provide guidelines, discusses with Business analyst, communicates any requirement changes, support the team |
| 3 | Business Analyst | Communicate with the test, technical and development leads, coordinates with the stakeholders and the project team. |
| 4 | Development Lead | Involves in the development team activities and coordinates with other team |
| 5 | Testing Team | Testcases, execute tests, test scripts, define metrics, communicates with the test lead. |
| 6 | Development Team | Review testing deliverables (test plan, cases, scripts, expected results, etc.) and provide timely feedback. Implement fixes to defects according to schedule. Support the development and testing processes being used to support the project. |
| 7 | Technical Lead | Provide technical support and coordinate with other team |

## PLAN FOR INCIDENT MANAGEMENT AND REPORTING

A standard protocol will be followed by the testing team to report any defect or incidents.

- The bug once identified will be made sure that it is reproducible by repeating the same protocol for three times. If bug is reproduced intermittently even it will be documented and reported.
- The bug will be classified into various categories like, login functionality, Add and Update information, Request form, Select Plans, Filter data by the Human resource, Database Functionality.
- All the supporting information will be documented in the bug report, a template is shown below that the tester will use for filing the report.
- From tester, it next will be reviewed by the test lead and manager for review and moves on to the next person. At this point, the report could be rejected, deferred or asked to be rewritten.
- A developer will be assigned to work on the report. The developer could either fix the problem and close the report. Or the defect could be deferred or failed to confirm the test, in which cases it will be reopened and assigned to the developer again based on the situational decision.

- The defect priority will be classified based on the following categorization(www.softwareTestingHelp.com)

| Severity | Impact |
|---|---|
| 1 (Critical) | ▪ This bug is critical enough to crash the system, cause file corruption, or cause potential data loss<br>▪ It causes an abnormal return to the operating system (crash or a system failure message appears). |

|  |  | ▪ It causes the application to hang and requires re-booting the system. |
|---|---|---|
| 2 (High) |  | ▪ It causes a lack of vital program functionality with workaround. |
| 3 (Medium) |  | ▪ This Bug will degrade the quality of the System. However, there is an intelligent workaround for achieving the desired functionality - for example through another screen.<br>▪ This bug prevents other areas of the product from being tested. However other areas can be independently tested. |
| 4 (Low) |  | ▪ There is an insufficient or unclear error message, which has minimum impact on product use. |

- Sample template for defect report:

| Category | Label | Value |
|---|---|---|
| Defect ID | ID number | D001 |
|  | Type | Login Functionality |
|  | Reporter | Deepa Natarajan |
|  | Submit Date | 2/27/2022 |
| Defect Overview | Summary | The login button did not respond to the click action |
|  | Error Message | NA |
|  | URL | insurance.com |
|  | Screenshot |  |
| Defect Details | Expected Result | The login button should take the click action to go to next page |
|  | Actual Result | The button was frozen |
|  | Test date/time | 02/17/2022 T 10:00am(cst) |
|  | Input data | User name-Emp0001 |
|  |  | password- Password!123 |
|  | Steps followed to create/recreate issue | Enter the URL. Enter the user id and the password. |
| Environment | Platform | Microsoft |
|  | Operating System | Windows 10 |
|  | Browser | chrome version 98.0.4758.102 |
| Defect Tracking | Severity | Medium |
|  | Priority | High |
|  | Assigned to | Developer A and Tester B |

The risk analysis is adopted from www. Softwarehelp.com

| Risk | Prob. | Impact | Mitigation Plan |
|---|---|---|---|
| **SCHEDULE**<br><br>Testing schedule is tight. If the start of the testing is delayed due to design tasks, the test cannot be extended beyond the UAT scheduled start date. | High | High | The testing team can control the preparation tasks (in advance) and the early communication with involved parties. Some buffer has been added to the schedule for contingencies, although not as much as best practices advise. |
| **RESOURCES**<br>Not enough resources, resources on boarding too late . | Medium | High | Holidays and vacation have been estimated and built into the schedule; deviations from the estimation could derive in delays in the testing. |
| **DEFECTS**<br>Defects are found at a late stage of the cycle or at a late cycle; defects discovered late are most likely be due to unclear specifications and are time consuming to resolve. | Medium | High | Defect management plan is in place to ensure prompt communication and fixing of issues. |
| **SCOPE**<br>Scope completely defined | Medium | Medium | Scope is well defined but the changes are in the functionality are not yet finalized or keep on changing. |
| Natural disasters | Low | Medium | Teams and responsibilities have been spread to two different geographic areas. In a catastrophic event in one of the areas, there will resources in the other areas needed to continue (although at a slower pace) the testing activities. |
| Non-availability of Independent Test environment and accessibility | Medium | High | Due to non-availability of the environment, the schedule gets impacted and will lead to delayed start of Test execution. |
| Delayed Testing Due To new Issues | Medium | High | During testing, there is a good chance that some "new" defects may be identified and may become an issue that will take time to resolve. |

| | | | There are defects that can be raised during testing because of unclear document specification. These defects can yield to an issue that will need time to be resolved. |
| --- | --- | --- | --- |
| | | | If these issues become showstoppers, it will greatly impact on the overall project schedule. |
| | | | If new defects are discovered, the defect management and issue management procedures are in place to immediately provide a resolution. |

Test metrics to measure the progress and level of success of the test will be developed and shared with the project manager for approval.  The below are some of the metrics

| Report | Description | Frequency |
| --- | --- | --- |
| Test preparation & Execution Status | To report on % complete, %WIP, % Pass, % Fail | Twice weekly (Tu/Th) |
| | Defects severity wise Status – Open, closed, any other Status | |
| Daily Execution status | To report on Pass, Fail, Total defects | Daily |
| Weekly Status report | Project driven reporting (As requested by PM) | Weekly |

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