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Chapter 1: INTRODUCTION

1.1 Background

Internship program has become the bridge for those who want to enter to corporate level from the college life. The Kathmandu University encourages bachelor's students to undertake an internship during their last semester of study. The importance of an internship is recognized by reputable organization which has provided a grant for my internship with the overall objective of skill and capacity building for graduate students. It is an internationally recognized culture that after undertaking a practical internship a student must submit a written report of his/ her time and experiences at the internship organization.

The opportunity to work for SEVA shifted my perspective, and pushed me to enhance the technical and nontechnical skills like soft skills. I spent a couple of months from the 6th of June extending to the 6th of September as a graduate intern. The experience was highly inspirational, and I would not trade it for any other experience if I could. In this internship report I have described my experiences during my internship period. Specifically, the internship report contains an overview of my host internship organization and the activities, tasks and projects that I have worked on during my internship.

1.2 Objectives

The primary objective of the internship is to generate a thorough understanding of the workplace relationship, performing of the activities and engaging oneself in the working environment. In a way, it was more to get practical implication of all the studies, theories that I had acquired so far. This would help me to pave a way towards growth in my academic as well as personal development. Apart from general objectives, the specific objectives are highlighted below:

- To acquire exposure in the working environment resulting in the development of practical knowledge, confidence and diplomacy.
- To learn and apply theoretical knowledge practically in the workplace.
- To develop interpersonal, managerial and communication skills.
- To understand the mechanism of how software are tested along with the use testing tools.

Chapter 2: INTERNSHIP INSIGHTS

2.1 About the company

SEVA Development is a socially minded Software Testing Outsourcing company located in Sundarbazar-11, Lamjung focused on helping Nepal build itself out of poverty. SEVA Development's mission is to provide high quality high paying jobs to Nepali graduates and economic development for their villages by providing economical, best-in-class software testing services to companies in the United States. [1]

It focuses on overtraining testers in Nepal in software development and then using them for low cost, high quality Software Testing and QA.

2.2 Services offered by SEVA

SEVA's team has technical expertise in different forms of testing including white box and black box testing within the agile testing life cycle to provide the best Software QA services available. Some of the services it provides are black box testing, white box testing, functional testing, usability testing and many more.

2.3 Internship deliverables

2.3.1 Training and Programs

During my three months' time at SEVA I was lucky enough to get enrolled in online trainings and workshops. This sort of activities has helped me to enhance my technical abilities and soft skills. I have pointed out the trainings and workshop I got involved in and some of them are:

1. **Udemy Online Course (The Best Software Training You'll Ever Get)**

It is the platform where we can learn any programming language, marketing strategy courses and much more. Udemy provides a platform for experts to create course which can be offered to people, either free or paid. During the period of internship, we got Testing training through this platform [2]. Following are the main topics that we learned during the internship period:

- Introduction to Software Testing
- Test Scenario, Test Cases and Test Plan Writing
- Test Execution
- Test Strategy and Defect Management
- JIRA, Bugzilla and q Test tools

- Automation Overview with QTP

2. Certified Tester Foundation Level(CTFL)Course

Certified Tester Foundation Level course provides us CTFL certification training that helps to pass ISTQB exam. CTFL certification is a rigorous, examination based, professional certification program accepted across the world [3]. This course establishes a professional's proficiency in Software testing. Some of the lessons learned are:

- Fundamentals of Software Testing
- Static Techniques
- Test Design Techniques
- Test Management
- Tools Support For Testing

3. KNOD Learning Experience

KNOD is the distant learning online platform where we can take and learn the courses easily in low price. KNOD creates a system where students, educators and employers collaborate on real-world projects generating the hands-on experience [4]. Things learned from KNOD are:

- Sync Session with Foreign Students
- System Analysis and Design Classes
- Video presentation
- Developing Elevators' Pitch

4. Code academy(Python and JavaScript Training)

Codecademy is a platform or an education company where one can have best learning experience in coding. Codecademy offers many tutorials for learning programming languages for free of cost. During the internship period I learned some Python and JavaScript language. Python was very useful for Selenium automation. JavaScript was useful while building website of Employee Information System.

2.3.2 Project and Deliverables

Team: **Project X**
Supervisor: **Mr. Peter West**
Project Name: **Namuna Hospital Management**
Application type: **Website**
Platform Used: **CSS, HTML, Mongo DB, Node.JS**
Testing Tool: **Selenium, UFT**

Project Management and Defect Tracking Tool: **JIRA**
Test Case Management Tool: ***Test link, q-Test***

- Development of Namuna Hospital Management Website using HTML, CSS, JavaScript(Node.JS)
- Connection of *Mongo DB* with *Node.JS*
- Implementation of the project in *Atlassian JIRA*(Project Management Tool)
- Identification of the *test cases* related with the project- Namuna Hospital Management
- Implementation of test cases in *Test link* and generation of the *test report*
- Integration of *JIRA* and Test link (i.e. Bug Tracking)
- Test cases report generation using *q-Test* and Test link
- Automation testing with *Selenium* in Python
- *Unit Functional Testing* (UFT), an automated functional testing tool

2.3.3 Contributions to the project

In the first place, we chose to make the website of a hospital named **Namuna Hospital Management** which is located nearby our office in Sundarbazar, Lamjung. We thought it would be a great help to the hospital for owning a website. As per the discussion held between the team members, tasks were assigned to each of the group members. I chose to work on with the database section of the project. Below are my deliverables for the successful completion of the project.

1. Website Development

- *Node.js* is an open source, cross-platform runtime environment for developing server-side and networking applications. Node.js applications are written in JavaScript, and can be run within the Node.js runtime on OS X, Microsoft Windows, and Linux. Node.js also provides a rich library of various JavaScript modules which simplifies the development of web applications using Node.js to a great extent.
- *Mongo DB* is an open-source document *database* that provides high performance, high availability, and automatic scaling. It is classified as No-SQL Database. Mongo DB has rapidly grown to become a popular database for web applications and is a perfect fit for Node.JS applications,

letting us to write Java script for the client, backend and database layer. Its schema less nature is a better match the constantly evolving data structures in web applications.

- Created database of the doctors, patients and inventories of the hospitals using Mongo DB
- Wrote the Node.JS form validation script for the newly admitted patients and also to keep the information about doctor's and patient's profile
- Connected Node.JS with Mongo DB
- Created Test Cases regarding project

2. Handled Project Management Tool JIRA

JIRA is a tool developed by Australian Company Atlassian. It is used for **bug tracking, issue tracking,** and **project management**. The basic use of this tool is to track issues, and bugs related to your software and mobile apps. It is also used for project management. The JIRA dashboard consists of many useful functions and features which make handling of issues easy [5]. Activities carried out in JIRA are:

- Created sprints
- Updated sprints on regular basis
- Listed out the issues found in the project
- Worked with dashboard

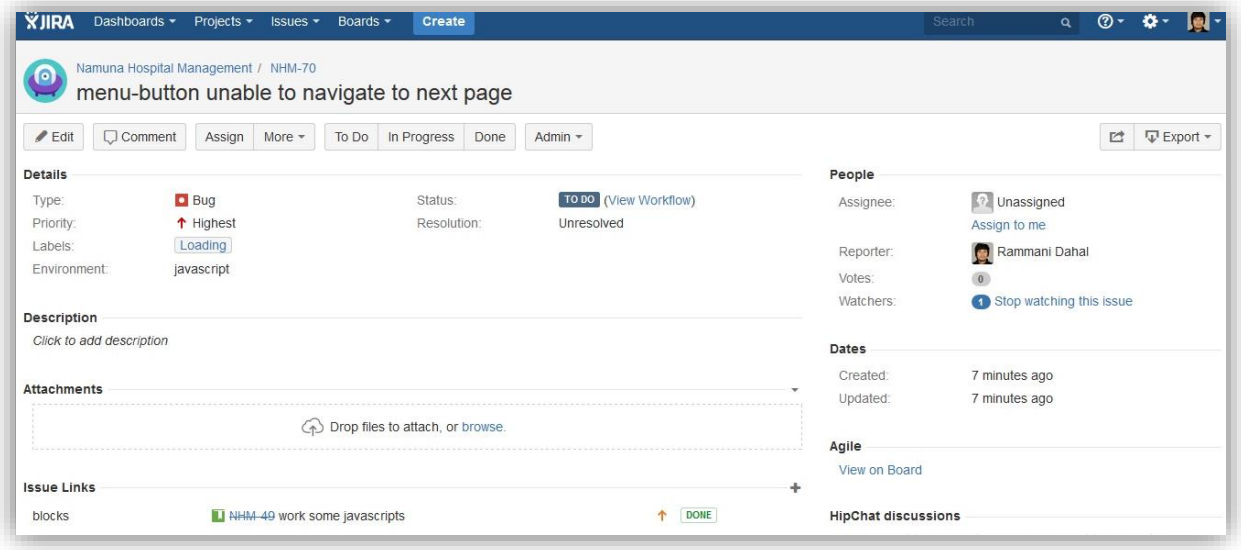

Fig: Handling Bug in JIRA

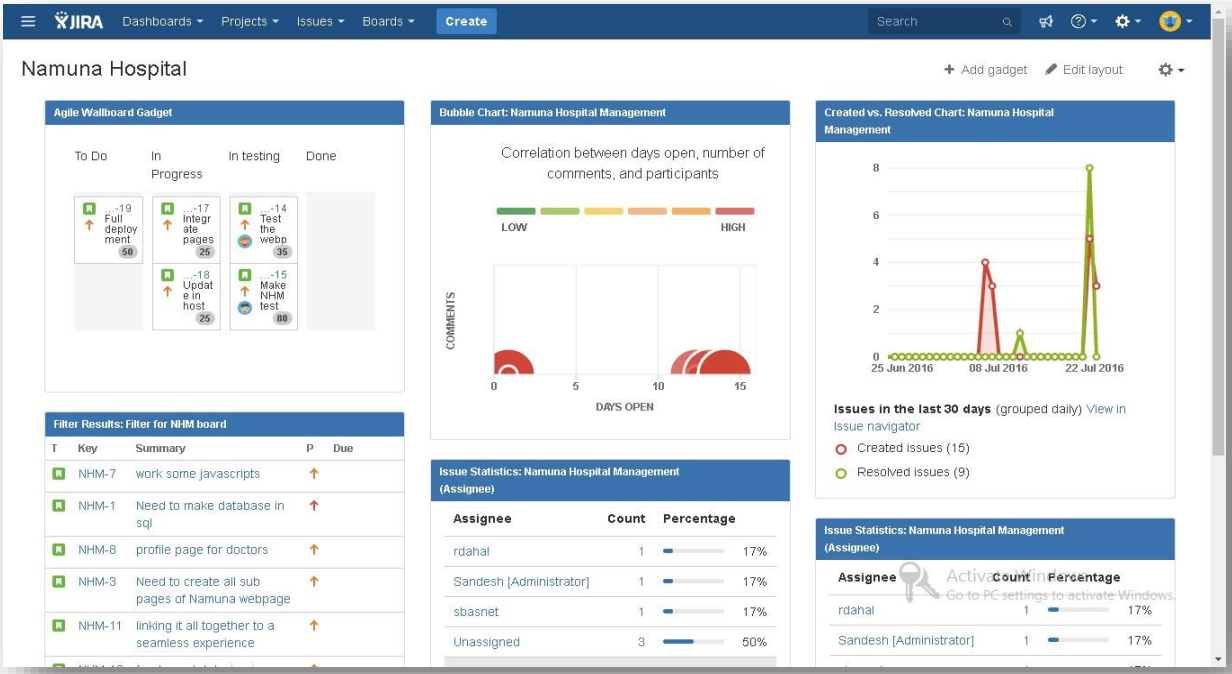

Fig: JIRA Dashboard

3. Worked with Test Cases using Test Link/q-Test(Test Case Management Tool)

Test Link is the open source test management system that helps to create test reports. The test report especially contains test case of passed or failed conclusion of system component. This test report helps to explain developer what are the defects present in the system.

- Created Test Project, Test Suite, Test Cases
- Executed and Generated the test report
- Integrated JIRA and Test link and tracked the bugs/issues

Q-Test is a test management software used by the small as well as large-scale organization. It helps to create a centralize test management system for easy communication and rapid deployment of the task to QA teams and developers [6]. Same activities were done using q test to become platform independent.

Snapshot:

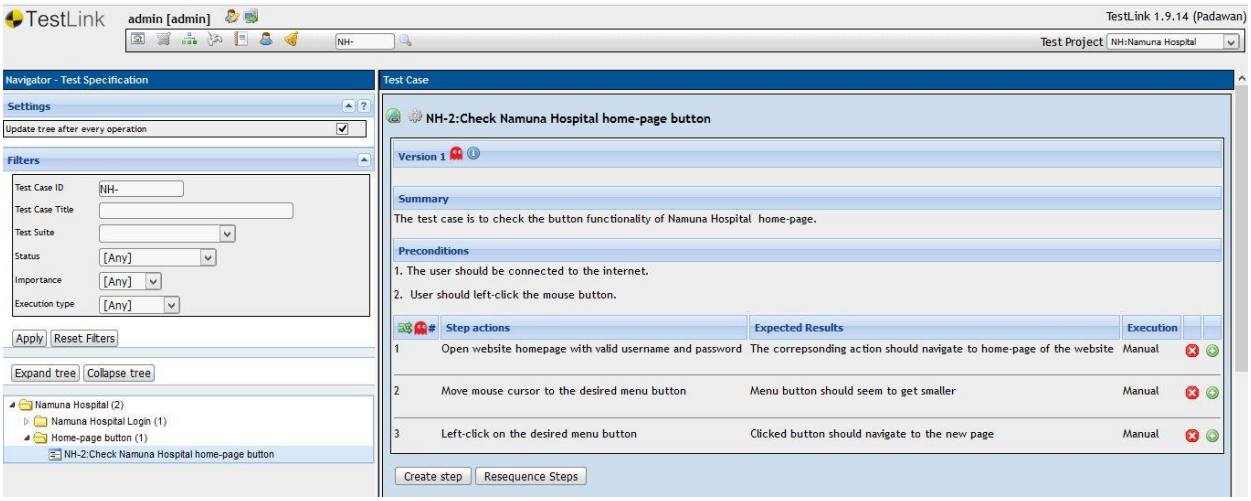

Fig: Test cases of NHM

Test Case Button-1: Check Namuna Hospital home-page button [Version : 1]		
Author:	admin - 21/07/2016 03:11:00	
Summary:		
The test case is to check the home-page button functionality of Namuna Hospital webpage.		
Preconditions:		
1. The user should be connected to the internet. 2. User should login successfully inorder to access the home-page button.		
#:	Step actions:	Expected Results:
1	Open home-page with successful login	Successful login should navigate to the home-page
2	Move the mouse cursor around the menu button in home-page	Menu button fades-in and fades-out
3	Left-click the mouse button on desired menu	It should navigate to the next page
Execution type:	Manual	
Estimated exec. duration (min):		
Importance:	Medium	
Requirements	02: Namuna Hospital home-page button	
Keywords:	None	
Execution Details		
Tester	admin	
Execution Result:	**Failed**	
Execution Mode:	**Manual**	
Execution duration (min):		
Related Bugs	**NHM-70 : [To Do] : menu-button unable to navigate to next page**	

Fig: Test report generation using Test link

4. Website Automation using Selenium Python

Selenium is an open source technology for automating browser-based applications. It is easy to get started with for simple unit and functional testing of a Web application. Selenium is not just a single tool but a suite of software's, each catering to different testing needs of an organization [7]. It has four components.

- Selenium Integrated Development Environment (IDE)
- Selenium Remote Control (RC)
- Web Driver
- Selenium Grid

During the internship program, Selenium IDE and selenium web driver were used. Selenium supports different languages and I did Selenium Python Unit testing automation. Through selenium IDE, test cases were automatically generated by recording the activities and selenium web driver is used to automate the web browser remotely.

Snapshot:

```
from selenium import webdriver
from selenium.webdriver.common.by import By
from selenium.webdriver.common.keys import Keys
from selenium.webdriver.support.ui import Select
from selenium.common.exceptions import NoSuchElementException
from selenium.common.exceptions import NoAlertPresentException
from selenium.webdriver.common.action_chains import ActionChains
import unittest, time, re

class Camel(unittest.TestCase):
    def setUp(self):
        self.driver = webdriver.Chrome("C:\python 3.5.2\Scripts\chromedriver.exe")
        self.driver.implicitly_wait(30)
        self.base_url = "https://www.skiutah.com/"
        self.verificationErrors = []
        self.accept_next_alert = True

    def test_camel(self):
        driver = self.driver
        driver.get(self.base_url + "/")
        element = self.driver.find_element_by_xpath('html/body/div[2]/div[1]/div[1]/div/div[1]/div
        driver.find_element_by_link_text("Activities").click()
        #driver.find_element_by_link_text("Deer Valley").click()

    def is_element_present(self, how, what):
        try: self.driver.find_element(by=how, value=what)
        except NoSuchElementException as e: return False
        return True

    def is_alert_present(self):
        try: self.driver.switch_to_alert()
        except NoAlertPresentException as e: return False
        return True
```

Fig: Python Code for web automation (Selenium Remote Control)

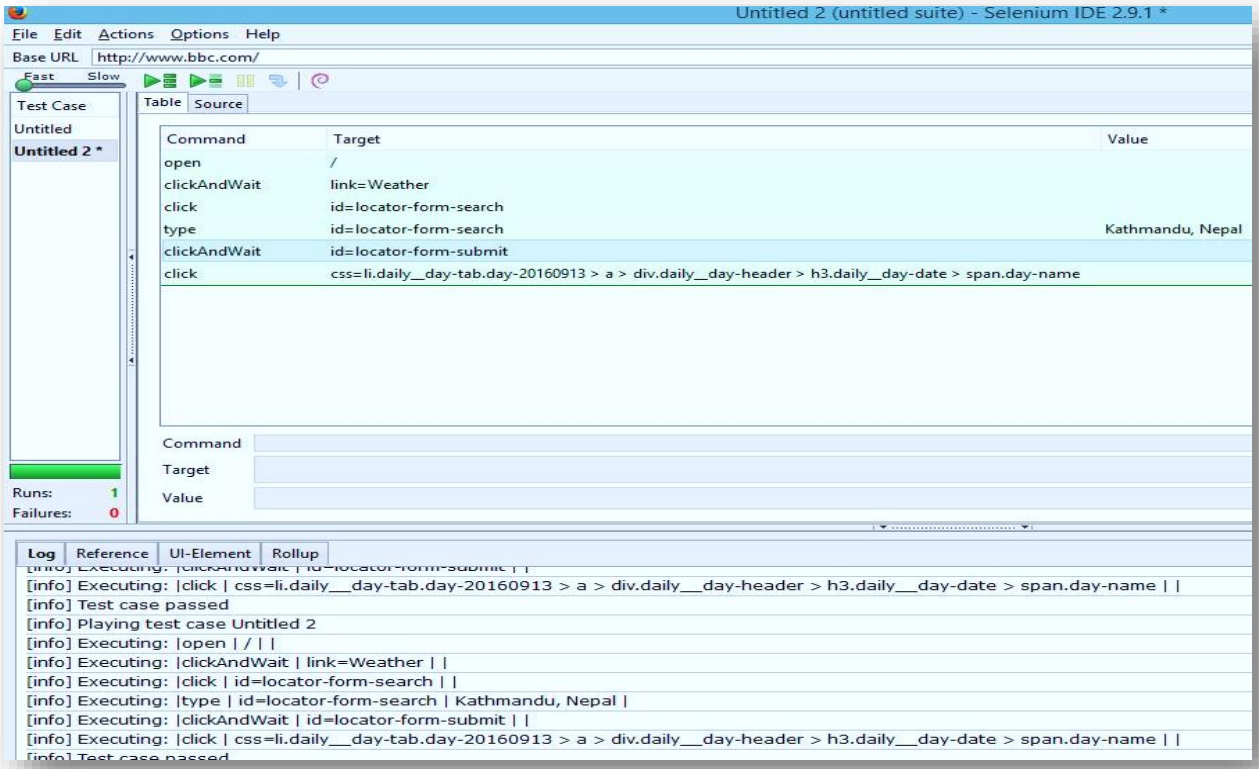

Fig: Selenium IDE for generating test cases

5. Functional Testing using Unit Functional Testing(UFT)

Unified **F**unctional **T**esting **(Q**uick **T**est **P**rofessional), popularly known by its acronym UFT is an automation testing tool originally from Mercury Interactive which was acquired by Hewlett Packard (HP) in 2006. UFT is primarily used for functional, regression and service testing. Using UFT, you can automate user actions on a web or client based computer application and test the same actions for different users, different data set, on various Windows operating systems and/or different browsers. [8]

UFT works using a scripting language called VB Script. We write a code in source code editor and give '.vb' as file extension and run the code in HP Functional Testing application.

Snapshot:

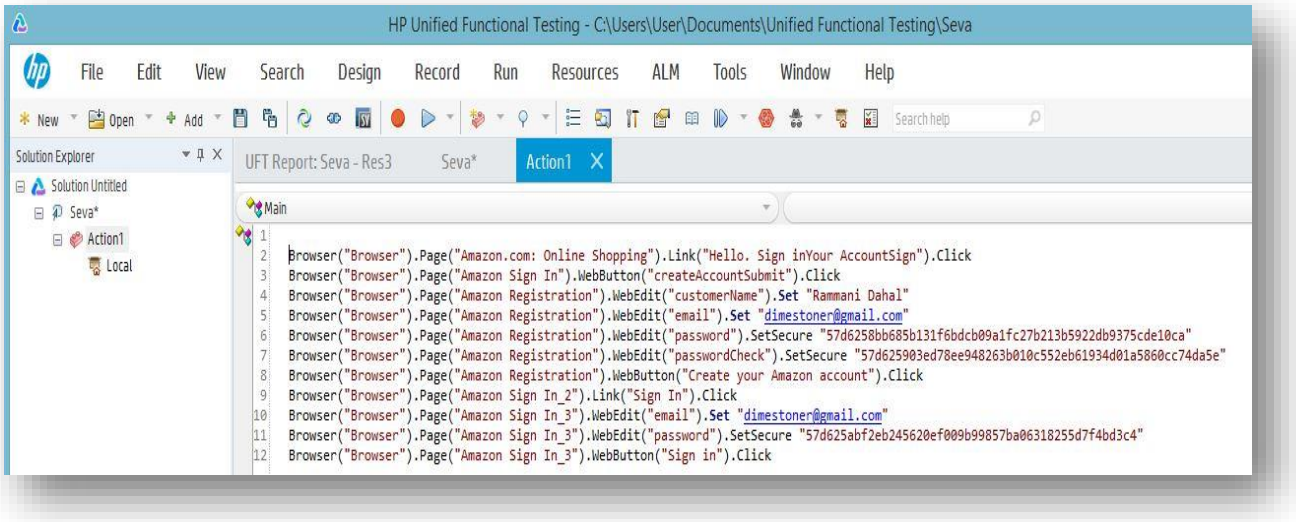

Fig: Automation through recording

Chapter 3: Key Achievements and Challenges

3.1 Goals Achieved During Internship

During my internship, I got a chance to improve and enhance my technical expertise as well as soft skills. This has made a positive impact on me and has helped me to boost up my confidence level. Some of the key achievements are listed below:

3.1.1 Improving communication skills

During the internship time frame, we were involved in soft-skills development training engaging in KNOD experience platform where we have to talk to foreign clients almost daily. The online presentation and meeting has contributed to my communication skill a lot. However, I realize that it is only a small fraction of development, which I must improve a lot more in future.

3.1.2 Use of knowledge and skills gained in University

The knowledge I have gained in Kathmandu University helped me to work during internship period. The software engineering course principles, software life cycle and programming that I have learnt during my bachelors were used to fulfil the expectations in internship period.

3.1.3 Better career development

As I have known, that testing QA has not been properly introduced in Nepal. Though various IT companies has QA department, only a few QA are employed. It seems that QA is less important than developer in Nepal which is not true because quality assurance only produces fruitful result. So I see that QA Company should be introduced in Nepal for good job opportunity. This internship program has insight me with better viewpoints for deciding my future.

3.2 How I fit into the company?

I worked here as a contractor. I work on my own part of my project and thus have my own area of responsibility. In particular, people understand that the things are new to me and that I thus work slower and ask basic question from time to time. Even

though this is the case, I have felt that I was an employee of the company the time that I have spent here and have thus got a good idea how it would be working here for real.

3.3 Challenges

Internship program has many learning curve and in those curves there resides many challenges. The challenges that I faced in this program are as follows.

- The most challenging task was how to get onboard as QA in IT industry. The task was different than developer. Using test tools was a new experience for me and it took me a lot effort to understand the principle of testing. I have gone through a lot of online course and training to understand working as a QA. It would have been difficult if I hadn't had any online courses about testing.
- Test link is very useful tool for generating the test cases. It was difficult to operate for a first time. It took me a lot of time to learn how to use Test link.
- Another challenge was Integration JIRA with test link. This was a toughest task and took a lot of time. After learning the basic operation numerous time, I got familiar to use JIRA and test link.
- Error detection in program codes was also difficult task. As the error was undetected in most cases. IT was almost impossible to detect an error unless program flow was clearly understood.

Chapter 4: CONCLUSION

In a nutshell, this internship has been an excellent and rewarding experience. I can conclude that there have been a lot I've learnt from my work at SEVA. Needless to say, the technical aspects of the work I've done are not flawless and could be improved provided enough time. As someone with no prior experience with Node.JS-, Mongo DB, Project Management Tools like JIRA, Test Case Management Tools like Test link, q Test and different testing tools like Selenium, UFT whatsoever I believe my time spent in research and discovering it was well worth it and contributed to finding an acceptable solution to test the web applications. Two main things that I've learned the importance of are time-management skills and self-motivation.

Some of these things that I have learned have been technically and others are more related to working in a company. It has been very nice for me to feel how it is to put my many years of study into practice. Working turned out to be approximately how I expected it to be, and I have confirmed that I can easily fit in a software testing company. On the technical front I have learned much. Before my internship at SEVA, I had very little knowledge on software testing and the way it is performed. Working at SEVA I have learned how the unit and functional testing are carried out and the use of advance testing tools like Selenium, Unified Functional Testing and so on. Another thing that I have learned during my internship is how easily I can fit into a different culture.

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