



INTERNSHIP REPORT

REPORT OF INTERNSHIP DONE AT INFUSE CONSULTING

OMKAR VAIBHAV SAVOIKAR

MCA SEM IV

2104



REPORT OF INTERNSHIP DONE AT INFUSE CONSULTING

Completed by
OMKAR VAIBHAV SAVOIKAR
Roll No 2104

for the partial fulfillment of
MCA Degree for Semester **IV**
Discipline of Computer Science and Technology,
Goa Business School,
Goa University

At
Infuse Consulting
Panaji, Goa, India
Under the guidance of
MR. SUBODH BORKAR
(Head of Product Development, useMango, Infuse Consulting)

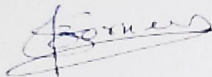
2nd June 2023

INTERNSHIP CERTIFICATE

This is to certify that **Omkar Vaibhav Savoikar**, Roll No. 2104, currently pursuing the 4th Semester of the MCA program in the Computer Science and Technology discipline at Goa Business School, Goa University, has been actively engaged as an intern with our organization since January 0th, 2023. During his internship, he has consistently displayed exemplary performance by successfully accomplishing assigned tasks and other related responsibilities.

Omkar exhibits a strong sense of self-motivation and requires minimal supervision to effectively complete his assigned tasks. He has demonstrated remarkable aptitude for swiftly acquiring the required domain knowledge and mastering the necessary technologies. His rapid learning pace has greatly contributed to the overall productivity and successful delivery of the team.

Yours Sincerely,



Subodh Borkar,
Head of Product Development - useMango

Infuse Consulting India Private Limited

B 902, Teerth Towers, Sr. No. 28/2, Near Raj Hotel, Baner, Pune 411021

India Company Incorporated by Government of India, Ministry of Corporate Affairs under number U74999PN2018PTC179748

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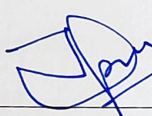
GOA UNIVERSITY



GOA BUSINESS SCHOOL

CERTIFICATE OF EVALUATION

This is to certify that Mr./~~Ms.~~ SAVOIKAR OMKAR VAIBHAV has successfully completed his/~~her~~ internship at Infuse Consulting, Panaji in partial fulfillment of the award of the degree in Master of Computer Application.


15/6/2023

Examiner 1

(Jyoti D. Pawar)



Examiner 2

[Kiran Kulkarni]

Place: Goa University

Date: 15/06/2023



Dean, Goa Business School

ACKNOWLEDGEMENT

Interning in a company is a golden opportunity for learning and self-development specially to have so many wonderful people lead me through this internship period. The internship wouldn't be complete without expressing my gratitude and appreciation to all the people who made it possible.

I would like to thank Mr. Nalin Parbhu (CEO/CTO, Infuse Consulting) for giving me the opportunity to intern at Infuse. My sincerest gratitude to Mr. Subodh Borkar (Head of product development at useMango) for being my mentor and giving me the necessary guidance and support. I express my deepest thanks to Piyush Sharma, Senior Software Engineer at Infuse Consulting for giving necessary advice and guidance throughout the internship. I would also like to thank all my senior coworkers for their help and support. I choose this moment to acknowledge their contributions gratefully.

I thank all the faculty and staff at the MCA, Goa University for their constant encouragement and support during the entire course work.

I perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on their improvement.

- OMKAR SAVOIKAR



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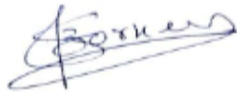
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INTRODUCTION

This report is a short description of my full-time on-site internship at Infuse.

I joined as an Intern at Infuse Consulting on 10th January 2022 and have been here since then. This report contains necessary information about the organization, the projects I worked on and the other tasks I completed in this internship period.

In the chapters that will follow, I will talk about the company, the work here, etc. Then, I shall elaborate on the projects I worked on, a brief information about the projects, the modules I built and the tasks I completed in those modules.

This report highlights my learning experience and my contributions to the organization as an intern. This will describe the knowledge that I gained by successfully completing the tasks that were assigned to me.

I'll also discuss the tools and technologies that were used, as well as the timeframe for my internship. Finally, I'll talk about my experience and how it has helped me grow both personally and professionally.

COMPANY PROFILE

Infuse Consulting:



Infuse Consulting is an international company and leverages strategic consulting partners as well as its technology partners to deliver the best solution.

Recognized as the leading provider of Test Automation and Lifecycle Transformation Services for successful, ambitious organizations, Infuse Consulting is headquartered in the UK and since 2002 has helped more than 500 businesses get the most out of their Software Delivery Teams.

Infuse Consulting works hard in the fields of Test Automation and DevOps to reliably deliver several clear benefits for organizations seeking assistance with their Software Delivery.

Infuse is a Gold Partner of Micro Focus and Oracle, and has a partner network including CA, Microsoft, AWS and SAP.

Infuse prides itself on its ability to provide innovative solutions, especially in test automation. They have been automating mobile testing since 2003 and developed a functional scriptless test automation tool, useMango™.



useMango:

- Easy to use Test Automation Tool.
- Designed so non-technical individuals can build robust automation scripts.
- Flexible framework functionality that can be adapted to match your testing ability.
- Avoids the costs of engineering your own high maintenance frameworks.
- You can use useMango to create automated tests for web and packaged applications such as Oracle and SAP.

Key benefits of useMango:

- Component based test building removes the need for technical developers.
- Reduce months of manual testing into minutes.
- Fast ROI, allowing you to focus on business-critical issues.
- Increase confidence in your continuous delivery output with automated end to end testing.
- Enable Continuous Delivery by adding automated end-to-end testing of your build pipelines.

About useMango:

With useMango tests are quicker and more efficient, saving businesses time and money. With useMango you can build a test by selecting from 200+ pre-built components, just add data and it is ready to run. If you have problems with forms, or complicated pages useMango provides an easy solution, you can activate the useMango scanner to scan your application, with a single click, this will identify all the testable objects on any UI and create a new component. If you need to create a custom component, useMango provides you the means to do so. A software tester can complement the useMango generated scripts with custom code, using in-built frameworks made with Ruby, VBScript, Python etc.

Other Key Features:

- Works on modern web & desktop applications.
- Codeless test tool & framework.
- Extended to support Package Applications SAP (GUI and Web Variants), Oracle E-Business, Oracle Fusion.
- Ensure application quality with fast and frequent testing.
- Test processes from end-to-end across multiple platforms and technologies.
- Business users and manual testers can automate tests without coding.
- Easily keep hundreds of tests up to date as your application changes over time.
- Expand the scope of your testing with data-driven tests.
- Meet exceptional automation requirements with simple scripted components.

- A scalable cloud-based test service which meets your growing needs.
- Get automated test outcomes directly in your continuous integration pipelines.
- Integrates with your modern continuous integration tooling.

OVERVIEW

UseMango is a windows application which has several different architectural structures, from the server to website and common libraries that contain shared code. UseMango is maintained and developed by the Infuse team and has customers worldwide.

Tools and Technologies used to develop useMango:

- Python
- Flask
- Ruby
- Selenium
- JavaScript
- AWS
- Git
- Docker
- Jenkins
- .NET framework
- C#
- WPF
- SAP
- VBScript

PROBLEM STATEMENT

During my internship, I focused on healing automated tests within the organization's testing framework. Through my observations and analysis, I identified a significant problem that required attention and resolution:

"The automated tests in the organization's testing framework frequently fail due to changes done to websites, resulting in unreliable test results and hindering the effectiveness of the testing process."

This problem statement addresses the recurring issue of inconsistent test environments, which directly impacts the reliability and accuracy of the automated tests. The problem leads to false positives or false negatives, making it challenging to assess the true quality of the software being tested. Furthermore, it introduces inefficiencies by requiring additional time and effort to diagnose and resolve test failures.

Throughout this internship report, I will delve into the root causes of this problem, analyze its impact on the testing process, and propose effective solutions to improve the stability and reliability of automated tests. By addressing this problem, I aim to enhance the overall efficiency and effectiveness of the organization's testing practices, leading to improved software quality and streamlined development processes.

MY CONTRIBUTIONS

From the start of the internship I was part of the KANBAN team of useMango. I was given a bug to fix in the app. After I had worked on the bug and fixed it, I was given the opportunity to write tests for two bugs solved by other developers.

After that I was given the opportunity to help in the upgrade of useMango from Ruby 2.3.3 to Ruby 3.0. During that time, I had to upgrade the useMango test components for one of their clients from Ruby 2.3 to Ruby 3.0.

During the Ruby upgrade testing, it was found out that some components of useMango didn't work properly. One of them was LaunchRemoteWebBrowser. I was told to find out the cause and fix it.

After that, I was given a feature to develop and to create a Proof of Concept (PoC) to be demoed to the Product Owner (PO) and other stakeholders. The feature included - "Writing a python script which will help in fetching an element when the web driver is unable to locate the element based on the inputs provided to the useMango during test run in order to avoid the test from failing only when the feature is turned on."

During this time, I along with my team studied the research previously done by our coworkers. Based on this research, we developed a script that can be used to heal failing test cases. We gave a demo of the working of the script to the PO. We updated the PoC based on the feedback provided by the PO. Then, we found approaches to integrate it with the useMango app. Also, we updated the previously developed script to include business logic. Once the PoC was complete, we gave a demo of it to the stakeholders.

After this, I was given another bug to fix in the useMango server.

TOOLS AND TECHNOLOGIES USED



C# is a general-purpose, modern and object-oriented programming language. It was developed by Microsoft led by Anders Hejlsberg and his team within the .Net initiative.



.NET Framework is a software framework developed by Microsoft that runs primarily on Microsoft Windows. It includes a large class library called Framework Class Library and provides language interoperability across several programming languages.



Ruby is an interpreted, high-level, general-purpose programming language. It was designed and developed in the mid-1990s by Yukihiro "Matz" Matsumoto in Japan.



Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting language.



JavaScript is a lightweight, interpreted, object-oriented language with first-class functions, and is best known as the scripting language for Web pages, but it's used in many non-browser environments as well.



React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. Although React is a library, it is widely used in web development. React makes it painless to create interactive UIs.



Amazon Web Services is a subsidiary of Amazon providing on-demand cloud computing platforms and APIs to individuals, companies, and governments, on a metered pay-as-you-go basis.



Postman is an API platform for building and using APIs. Postman simplifies each step of the API lifecycle and streamlines collaboration so you can create better APIs faster.



Git is a distributed version-control system for tracking changes in source code during software development. It is designed for coordinating work among programmers, but it can be used to track changes in any set of files.



MongoDB is a non-relational document database that provides support for JSON-like storage. The MongoDB database has a flexible data model that enables you to store unstructured data.



Flask is a lightweight and flexible Python web framework that simplifies the creation of web applications. It provides essential tools and libraries for routing, template rendering, and request handling. Flask is widely adopted for building small to medium-sized web applications and APIs.



Jenkins is a widely used open-source automation server that helps automate various stages of the software development lifecycle. It enables continuous integration and continuous delivery by automating build, test, and deployment processes.



Docker is an open-source containerization platform that allows developers to package and deploy applications with their dependencies as lightweight, isolated containers. It simplifies the software deployment process, ensuring consistency across different environments and making applications more portable and scalable.



Selenium is a popular open-source framework for automating web browsers. It provides a suite of tools and libraries that allow developers to interact with web applications, simulate user actions, perform testing, and automate tasks across different browsers and platforms.



Jira is a proprietary issue tracking product developed by Atlassian that allows bug tracking and agile project management.

CERTIFICATIONS COMPLETED UNDER INTERNSHIP AND SELF STUDY

- International Software Testing Qualifications Board - Foundation Level Certificate in Software Testing



SUMMARY

This internship report provides an overview of my internship experience, which involved bug fixes, test writing, and developing a proof of concept (PoC) for a new feature in the company's product, useMango.

Throughout the internship, I actively participated in resolving software bugs by identifying and addressing issues in the codebase. Additionally, I contributed to the development of the testing infrastructure by writing comprehensive and reliable tests to ensure the stability and quality of the product.

One of the key highlights of my internship was working on the development of a PoC for a new feature in useMango. This involved conducting research, designing and implementing a functional prototype, and demonstrating its potential value to the company.

By actively engaging in bug fixes, test writing, and PoC development, I gained practical experience in software development and improved my technical skills. Moreover, I had the opportunity to collaborate with team members, learn from their expertise, and contribute to the company's ongoing product development efforts.

This internship report reflects on the experiences, challenges, and lessons learned during my time at the company. It serves as a documentation of the work accomplished, the skills acquired, and the value I added to the organization's software development processes.

INTERNSHIP TIMELINE

January 2023

- Week 1
 - Formal Orientation and onboarding process.
 - Demo Oracle EBS, SAP & Mobile.
 - Exploring features of useMango.
 - Creating tests with useMango - utilizing all features of useMango in depth including composites, scripted components and test flow control
- Week 2
 - Programming with Ruby
 - HTML, JS & DOM
 - Element identification
 - Introduction to automation
 - Selenium
 - Git & Source code management
- Week 3
 - Containerization
 - Tutorial on Docker
 - Workshop project to build Containerized testing framework

- CI CD pipelines (Jenkins)

February 2023

- Week 4

- CI/ CD workshop (Jetbrains Teamcity)
- Programming in Python
- Introduction to WebService architecture
- Python WebService Framework
- Workshop: WebService Unit Testing + API Testing

- Week 5

- Workshop involving the use of the entire set of skills learned so far to develop a Full-stack web application.

- Week 6

- Introduction to AWS Services

- Week 7

- Workshop for manual deployment web application developed to AWS
- Infrastructure as Code
- Workshop for automated deployment web application developed to AWS

March 2023

- Week 8
 - Demo of the projects to Head of Training
- Week 9
 - Training for ISTQB
 - ISTQB Testing certification
- Week 10
 - Learning about C#, .NET, WPF
- Week 11
 - Replacing all LaunchWebBrowser components in all tests as needed by a particular client for testing the new ruby upgrade
- Week 12
 - Bug fix: Unable to update description of a scripted component in useMango App

April 2023

- Week 13
 - Bug fix: Unable to update description of a scripted component in useMango App
 - Demo bug fix to Product Owner (PO)
- Week 14
 - Write test cases for bugs fixed by others

- Ruby upgrade testing for a client project
- Week 15
 - Ruby upgrade testing for a client project
 - Write test cases for bugs fixed by others
- Week 16
 - Bug fix: Standard component LaunchRemoteWebBrowser not working for Ruby upgrade
 - Write test cases for bugs fixed by others

May 2023

- Week 17 - 18
 - Self Healing: Create a barebones PoC for ‘healing’ automation testing
 - Demonstration of the PoC made to the product owner
 - Implementing the suggested changes
- Week 19
 - Compile the research done on Self Driven Tests feature and create documentation for it
 - Demo the documentation to the PO
- Week 20
 - Integrate Self-Healing module in useMango
 - Fix the issues encountered while integrating the module

June 2023

- Week 21
 - Training on consultancy skills, Project management
 - Fix the issues encountered while integrating the module
- Week 22
 - Completed with the integration with useMango
 - Demo the PoC to stakeholders
 - Document the PoC details
 - Bug fix: Unable to create a composite component
- Week 23
 - Bug fix: Unable to create a composite component

EXPERIENCE OF INTERNSHIP

During my internship at Infuse Consulting, I had the opportunity to work on a variety of tasks, including bug fixes, test writing, and developing a Proof of Concept (PoC) for a new feature in the company's product - useMango. This experience provided me with valuable insights, professional growth, and a deeper understanding of software development processes.

Bug Fixes:

As part of the development team, I actively participated in identifying and resolving software bugs. I collaborated closely with senior developers, learning to navigate complex codebases and understand the debugging process. This hands-on experience allowed me to enhance my problem-solving skills and develop a keen eye for identifying and addressing software issues efficiently.

Test Writing:

A crucial aspect of ensuring the quality and stability of the product involved writing comprehensive tests. I contributed to the development of the testing infrastructure by creating test cases, executing tests and verifying the product's functionality. This experience taught me the importance of meticulous testing and its role in delivering reliable software.

Proof of Concept Development:

One of the most exciting aspects of my internship was working on a PoC for a new feature in useMango. I was involved in designing the feature, implementing a functional prototype, and presenting it to the stakeholders. This experience allowed me to explore new technologies, exercise my creativity, and gain hands-on experience in the entire development lifecycle.

Collaboration and Learning:

Throughout my internship, I had the opportunity to collaborate with talented and experienced professionals. Working alongside them, I learned industry best practices, gained insights into agile development methodologies, and honed my communication and teamwork skills. The guidance and mentorship I received from my colleagues greatly contributed to my growth as a software developer.

Overall, my internship experience at Infuse Consulting was incredibly rewarding. It provided me with a holistic understanding of software development processes, from bug fixes to test writing and feature development. I acquired valuable technical skills, enhanced my problem-solving abilities, and developed effective collaboration and communication skills.

This internship has undoubtedly strengthened my passion for software development. The experience gained during this period will undoubtedly be an asset as I embark on my future endeavors in the field of software engineering.

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