



INTERNSHIP REPORT

Tejas Deepak Lotlikar

2033

REPORT OF INTERNSHIP DONE AT INFUSE CONSULTING

SUBMITTED BY

TEJAS DEEPAK LOTLIKAR

2033

for the partial fulfilment of

MCA Degree for Semester VI

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)

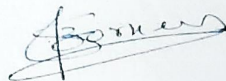
2nd June 2023

INTERNSHIP CERTIFICATE

This is to certify that **Tejas Deepak Lotlikar**, Roll No. 2033, currently pursuing the 6th 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 9th, 2023. During his internship, he has consistently displayed exemplary performance by successfully accomplishing assigned tasks and other related responsibilities.

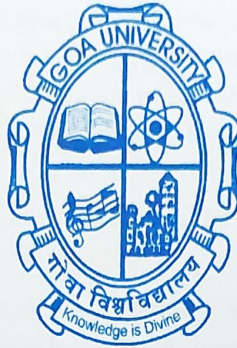
Tejas exhibits a strong sense of self-motivation and requires minimal supervision to effectively complete his assigned tasks. He has demonstrated remarkable aptitude for swiftly acquiring the required domain knowledge and mastering the necessary technologies. His rapid learning pace has greatly contributed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

Yours Sincerely,



Subodh Borkar,
Head of Product Development - useMango

GOA UNIVERSITY



GOA BUSINESS SCHOOL

CERTIFICATE OF EVALUATION

This is to certify that Mr. Tejas Lotlikar has been evaluated for the project work titled **"Report of Internship done at Infuse Consulting"** in partial fulfilment for the award of the degree in Master of Computer Application.

Examiner 1

Examiner 2

Place: Goa University

Date: 15th June 2023

Dean, Goa Business School

Acknowledgement

The internship opportunity I had with Infuse was a great chance for learning and professional development, especially to have so many wonderful people leading me throughout this 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 useMango, Infuse Consulting) for being my mentor and giving me necessary advice and guidance. I choose this moment to acknowledge his contribution gratefully.

My great appreciation to Mr. Piyush Sharma (Product Engineer, Infuse Consulting) who in-spite of being extraordinarily busy with his duties, took time out to hear, guide and keep me on the correct path and allowing me to carry out my tasks during the internship.

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

I would like to thank my family and friends for all the love, support and encouragement they provided me during this internship which will never be forgotten.

Finally, I would like to express my gratitude towards the Infuse family, especially my seniors Delroy Martins, Imtiyaz Khan, Vinay Prabhu, Joyrel Vaz, Onkar Parshekar, Rochelle Martins, Minaxi Patil, Preshly Fernandes who were always ready to help me and guide me. Also, I would like to thank my internship colleagues for helping me to learn new things and always supporting me during this period.

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.

- Tejas Lotlikar



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U74999PN2018PTC179748
www.infuse.it

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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 9th January 2023 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, the culture, 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



About 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™.



What is 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.

What are the key benefits of using 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.

Product – UseMango

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

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

My Contributions

The internship started off with extensive training sessions, wherein I acquired essential skills and knowledge relevant to the company's operations. I diligently absorbed the training material and actively engaged with trainers and mentors to enhance my understanding. This enabled me to quickly grasp concepts and adapt to the company's work environment.

Initially as a part of training I was given a demo of useMango app and told to explore the application and its features, write tests, execute the tests, view the results and a review session was held wherein all that was learnt was shared among the other interns and feedback was given by the mentor.

Based on my experience and understanding of the platform, I brainstormed ideas for enhancing its usability, functionality, and overall user experience. These suggestions encompassed areas such as user interface improvements, streamlining processes, introducing additional features, and enhancing the platform's performance and stability.

Followed by this I was able to gain hands on experience in writing clean, optimized, compliant with coding standards and testable code in Ruby and Python. Training about about HTML, CSS and JS was provided. I also learnt about automation using Selenium. I had a good learning about version control using Git. Topics such as containerization using Docker and CI/CD pipelines with Jenkins were covered as well. Also, lessons about web service using Flask API that included API testing using Postman were given. We were also taught how to write unit tests, API test, testing coverages, mocking APIs. Lastly, I gained a brief understanding of AWS services. Each part of the training was supported with a set of exercises. I had a great learning experience from these exercises and given the reviews by mentors based on the exercises, I was able to make needful improvisations. The training ended with a one week long task that was about developing a full stack web project using the tools and technologies we learnt whilst the training.

After two months of training, all interns were supposed to answer ISTQB Foundation Level Exam for ISTQB CTFL Certification. The ISTQB Foundation Level Certification (CTFL) exam is required for everyone who tests software full-time or part-time, including software testers, QA analysts, product owners, developers, and automation engineers. While preparing for the exam, I got to learn in-depth about different phases of SDLC and various types of testing. My mentors assisted me in my preparations which helped me achieve my

certification and also enhanced my knowledge regarding the same.

Once the training had completed, I had to do self-learning about C# and WPF (Windows Presentation Foundation – UI framework used for building desktop applications). I became a member of Kanban team (Development). Using the knowledge of WPF which I had learnt I solved my first bug in useMango App. Later on, I had a task to modify around 50+ tests written in useMango since the client wanted to test if the new components are working.

After completing them, I have solved at least 4-5 issues primarily in SAP components ranging from unable to find a certain element in SAP GUI, to writing complex scripted components to be able to achieve special requirements of the clients. I had to self-learn VBScript to write scripted components for SAP. also had to write some components as an enhancement for the ones previously existed which I had to do for some specific tickets on which me and my senior worked on.

I also had the opportunity to be part of a 3-member team consisting of two interns and our senior developing a feature for useMango- Self-Healing. Self-healing in automated testing is a solution to resolve key issues that arises due to changes to the properties (locators) of the web elements, such as Name, ID, XPath, and CSS. When these attributes change or break, test step fail, leading to the collapse of the complete test case. With self-healing (replacing incorrect locators with the appropriate ones) ability, useMango app will be able to solve this issue regardless of the changes made to the website UI. The research team contributed in the findings that showcased how our competitors have incorporated self-healing into their products and their underlying working.

My duty was to provide a solution for self-healing and integrate it end-to-end with useMango App along with the business logic as well. We needed to make sure only those who have availed the service should have access to it. We managed to complete the feature along with lot of learnings through the journey. We demonstrated the feature and now finally, it has been passed to the sprint team for development.

Tools and Technologies Used



Python is a versatile and high-level programming language known for its simplicity and readability. It offers a wide range of libraries and frameworks, making it ideal for tasks such as web development, data analysis, artificial intelligence, and automation.



JavaScript is a popular scripting language used primarily for web development. It enables dynamic content, interactive features, and client-side functionality on websites. With its extensive ecosystem and frameworks like React and Angular, JavaScript powers modern web applications.



Git is a distributed version control system widely used in software development. It allows multiple developers to collaborate on a project, managing source code versions, branches, and merging changes. Git provides a reliable and efficient way to track and manage code changes.



Flask

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.



Postman is a popular collaboration platform used for testing, documenting, and sharing APIs. It simplifies API development workflows by allowing developers to send HTTP requests, analyze responses, and automate testing processes. Postman improves efficiency and ensures reliable API interactions.



Ruby is a dynamic, object-oriented programming language known for its simplicity and readability. It emphasizes productivity and follows the principle of "Convention over Configuration." Ruby on Rails, a popular web development framework, is built on Ruby and enables rapid application development.



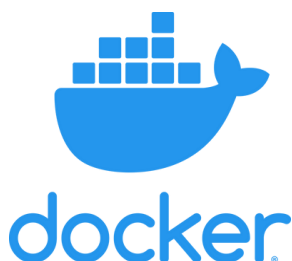
C# is a versatile programming language developed by Microsoft. It is widely used for building Windows desktop applications, web services, and game development using the Unity engine. C# offers a rich set of features, strong type checking, and seamless integration with the .NET framework.



.NET is a powerful and versatile framework developed by Microsoft. It provides a platform for building various types of applications, including web, desktop, mobile, and cloud-based solutions. .NET offers a vast library ecosystem, cross-language compatibility, and seamless integration with Microsoft technologies.



Amazon Web Services (AWS) is a cloud computing platform that offers a wide range of scalable and cost-effective services. It provides infrastructure resources, storage, and computing power, enabling businesses to build and deploy applications quickly. AWS is known for its reliability, flexibility, and extensive service offerings.



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.



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 (CI/CD) by automating build, test, and deployment processes. Jenkins supports integration with numerous tools, plugins, and workflows, making it highly flexible and extensible.



SAP is a leading enterprise resource planning (ERP) software company. SAP offers a wide range of software solutions designed to streamline and optimize business processes across various industries. SAP solutions help organizations improve efficiency, enhance decision-making, and drive digital transformation within their operations.



VBScript is a scripting language commonly used for Windows-based systems and applications, including SAP. It allows developers to automate SAP tasks and interact with SAP's programming interfaces, such as SAP GUI Scripting. With VBScript, users can create scripts that automate transactions, retrieve and manipulate data from SAP systems, and integrate SAP functionality into other applications.

Screenshots



Figure 1 ISTQB Foundation Level Certification (CTFL)

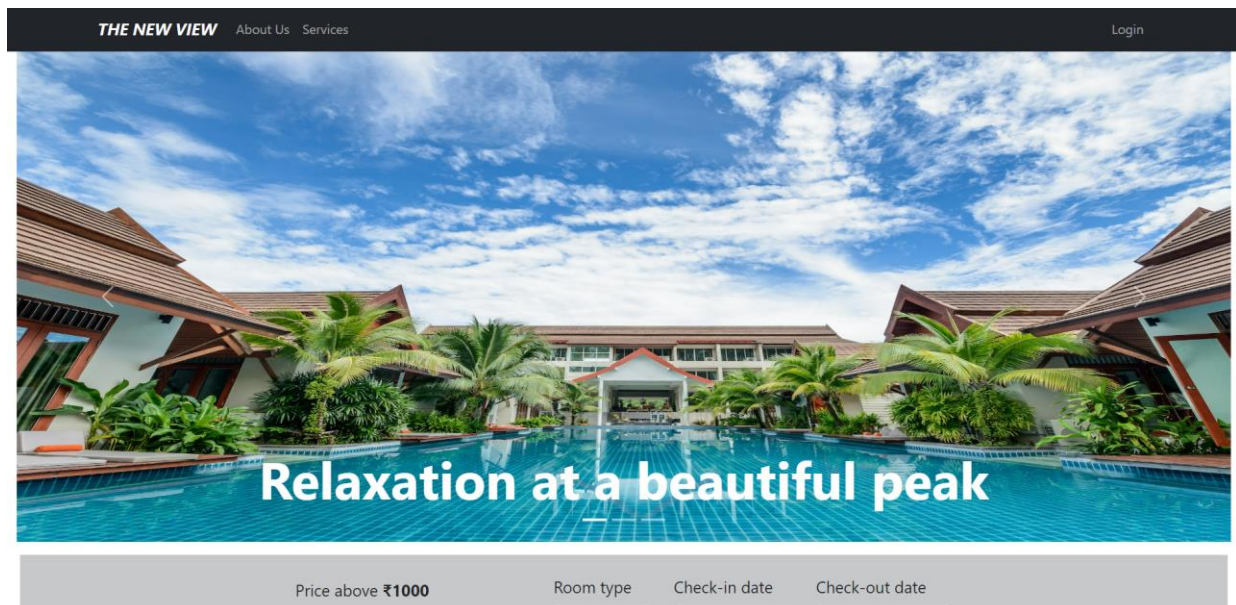


Figure 2 Homepage of the website developed as a part of workshop

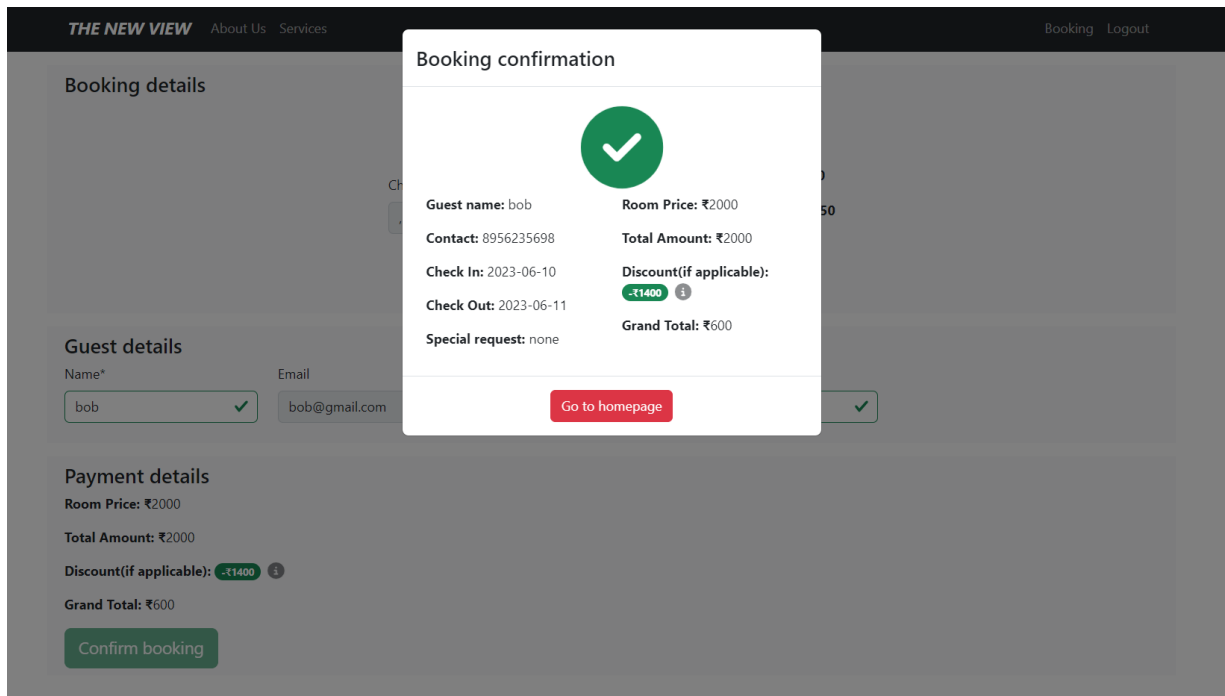


Figure 3 Room booking

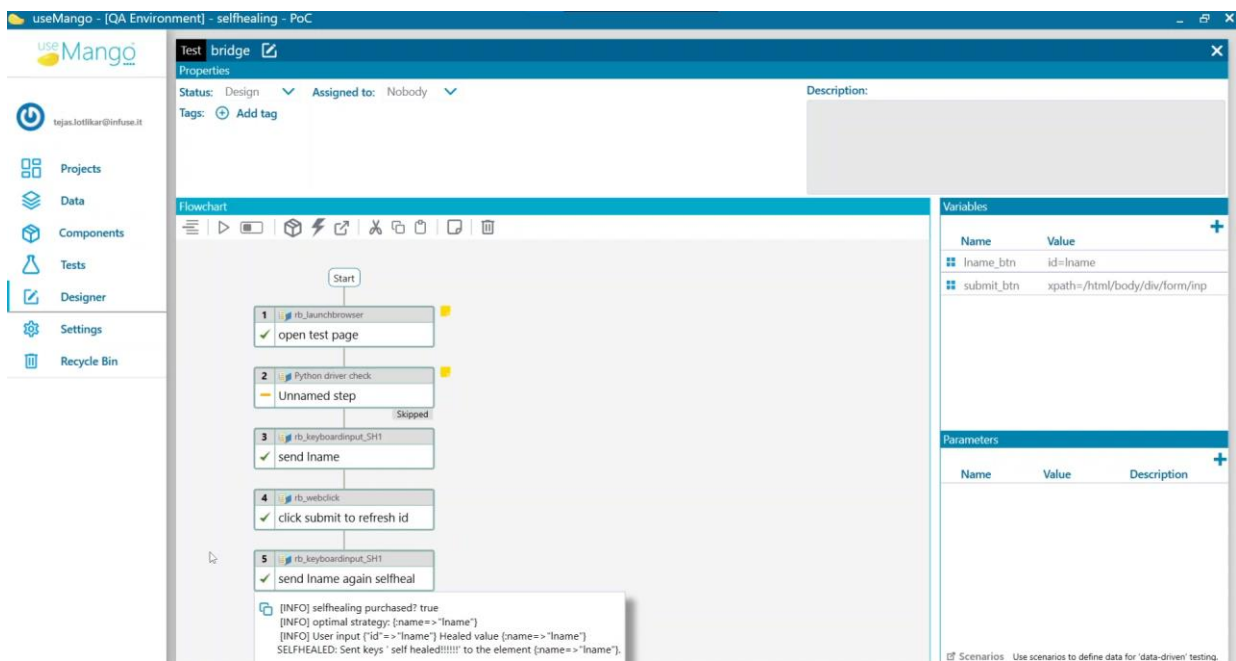


Figure 4 Self healing in useMango with business logic

Project timeline/Project diary

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(with Jenkins)

February 2023

- Week 4
 - CI/ CD workshop
 - Programming in python
 - Introduction to WebService architecture
 - Python WebService Framework
 - Workshop: WebService Unit Testing + API Testing
- Week 5
 - Workshop involving the use of entire set of skills learned so far to develop Full-stack web application, live at <http://tejas-infuse-exercise.s3-website.ap-south-1.amazonaws.com/>
- 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
 - First bug solved by me: Unable to copy values of output variables of steps previously ran in test designer (useMango app)

April 2023

- Week 12
 - Provided fix for a client who was facing an issue to interact with a dynamically rendered button in SAPGUI
 - Created a scripted component (in VBScript) for a client who was unable to identify a sub-tab within a tab.
- Week 13
 - Created a scripted component (in VBScript) for a client who was unable to access a field in a table in SAP Table
- Week 14
 - Written test cases for a bug fixed by one of the interns
 - Fixed a bug in VerifyWebCheckbox component.
- Week 15
 - Created a scripted component (in VBScript) for a client who was Scanned component doesn't identify a specific field in SAPGUI. Also provided an alternate solution in case.

May 2023

- Week 16
 - Written test cases, prepared a test plan and executed the test plan for a bug fixed by one of my seniors
- Week 17
 - Self Healing: Create a barebones PoC for 'healing' automation testing
 - Demonstration of the PoC made to the product owner
 - Implementing the suggested changes
- Week 18
 - Compile the research done by seniors, interns and create documentation for Self Healing
 - Provide documentation for the PoC made

- Week 19
 - Integrate Self-Healing module in useMango
 - Fix the issues encountered while integrating the module

June 2023

- Week 20
 - Fix the issues encountered while integrating the module
 - Completed with the Integration with useMango.
- Week 21
 - Training on consultancy skills, Project management

My Reflections / Experiences of Internship

My Internship at Infuse Consulting has been a wonderful experience. Facing new challenges every day is a norm here at Infuse. An undying hunger to learn more is something that is cultivated in the employees here. Being in industry and working on a product helped me a lot to learn and gain experience.

At Infuse, I never felt alone as I was provided freedom to interact, consult, seek help and guidance, etc. from any colleagues. I got to learn a lot about software, clean code architecture, writing better code and a lot of other things during the internship. Trying out new stuff and getting it implemented in the product without even knowing about it, is what makes it possible to try out and learn new things every day.

Overall, I'm very happy to be part of Infuse and learning a lot of new things. My best of wishes to everyone here.

References

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