

Software Engineering Internship

An Internship Report for

Course code and Course Title: CSA-652 & Industry Internship

Credits: 16

Submitted in partial fulfillment of Masters Degree
MCA in Subject/Specialization

By

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Seat Number:

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Under the Mentorship of

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Computer Science & Technology
Goa Business School



GOA UNIVERSITY

Date: JUNE 2024

Examined by:

Seal of the School/Dept

DECLARATION BY STUDENT

I hereby declare that the data presented in this Internship report entitled, “Software Engineering Internship” is based on the results of investigations carried out by me in the Computer Science & Technology at Neighborly , under the mentorship of Mr. Pramod Divakarla and the same has not been submitted elsewhere for the award of a degree or diploma by me. Further, I understand that Goa University or its authorities/College will be not be responsible for the correctness of observations /experimental or other findings given the internship report/work.

I hereby authorize the University/college authorities to upload this dissertation on the dissertation repository or anywhere else as the UGC regulations demand and make it available to any one as needed.

Signature and Name of Student

Seat no: 22P0320036

Date: June 2024

Place: Goa University

COMPLETION CERTIFICATE

COMPLETION CERTIFICATE

This is to certify that the internship report "Software Engineering Internship" is a bonafide work carried out by Mr. Richard Santosh Mascarenhas under my mentorship in partial fulfillment of the requirements for the award of the degree of Masters of Computer Applications in the Discipline Computer Science & Technology at the Goa Business School, Goa University.

Date:


Mr. Pramod Divakarla

Signature of Dean of School/HoD

School/Department

StampDate:

Place: Goa University

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Offer Letter



September 22, 2023

Mr. Richard Santosh Mascarenhas
H.No-97, Murda Grande Nuvem South Goa - 403604.
richardmascarenhas21568@gmail.com
9112821688

Dear Mr. Richard Santosh Mascarenhas,

Neighborly Global Capability Center LLP is pleased to have you on board as an Intern. The duration of this internship is **6 months** starting from January 08, 2024 to July 05, 2024.

You are eligible for a monthly stipend of **INR 30,000** subject to withholdings/deduction of tax at source under prevailing regulations.

Neighborly Global Capability Center LLP subjects you to be bound by all employment rules, regulations, policies, code of ethics issued by the Organization from time to time. Furthermore, upon the successful completion of your internship and in alignment with meeting the organization's expectations, an offer letter for a full-time position will be extended to you.

Congratulations on your internship!

Best wishes,

A handwritten signature in black ink, appearing to read "Shekhar Manjargi".

Shekhar Manjargi
VP Engineering, India Site Lead

Acknowledgement:

I have read and understood the provisions of this letter, and I accept the internship opportunity.

Intern Signature: _____

A handwritten signature in blue ink, appearing to read "Richard Mascarenhas".

Date: 23/09/23

NEIGHBORLY GLOBAL CAPABILITY CENTER LLP
(Entity registered with Limited Liability)

Registered Office: Ground & Mezzanine Flrs, Prestige Sterling, Square 4, SBI Road, Shanthala Nagar,
Bengaluru, Bangalore, Karnataka, India, 560001
LLPIN: ABZ-4259 | GSTIN: 29AAUFN7282K1Z8
Place of business: Roshni WeWorks, Marathahalli

Internship Certificate

The Neighborly logo, featuring the word "neighborly" in a bold, lowercase, sans-serif font.

INTERNSHIP CERTIFICATE

This letter is to certify that **Mr. Richard Santosh Mascarenhas**, student at **Goa Business School**, undergoing **Master of Computer Application** has successfully completed internship between **January 08, 2024, and July 05, 2024**. at **Neighborly Global Capability Center LLP**. He actively participated in several activities during the period of internship and learned skills such as **React, C#, various automated testing frameworks, databases, and the Agile/Scrum processes and practices**.

Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Shekhar Manjargi".

Shekhar Manjargi
VP Engineering, India Site Lead
Date: June 05, 2024
Bangalore

NEIGHBORLY GLOBAL CAPABILITY CENTER LLP

(Entity registered with Limited Liability)

Registered Office: GRA-108, WeWork Roshani Arcade, Marathahalli Main Road, Lakshminarayana
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ACKNOWLEDGEMENT

I would like to express my deepest gratitude to the following individuals and teams for their valuable support, guidance, and encouragement throughout my internship at Neighborly Solutions:

I am immensely grateful to our VP Site leader Mr. Shekar Manjargi for trusting me and providing me with the opportunity to work as an intern at Neighborly . His vision and leadership have created a dynamic and enriching work environment that fosters growth and learning.

I extend my heartfelt thanks to my mentor Mr. Roshan Jose for his dedicated mentorship and guidance. His expertise and insights in Front End Development have been instrumental in shaping my skills and knowledge during the internship.

I would also like to express my appreciation to the Digital Manager Mr. Pramod Divakarla who gave a lot knowledge of the digital platform and guided me with the proper tech stack . Furthermore , A special thanks to our Director Mrs. Pradyumna Pangarkar for his assistance throughout this internship. His support mattered a lot ensuring a smooth internship experience.

My sincerest gratitude to our Principal Architect Pankaj Jain for his continuous support and guidance throughout my internship. His expertise and willingness to help have played a crucial role in my professional development.

Last but not the least , I would also like to extend a special thanks to our Product Owner of the warm up project Mr. Vinay Kejriwal for his exceptional mentoring and motivation. His guidance not only in professional aspects but also in personal growth has been valuable, making my internship experience even more enriching.

EXECUTIVE SUMMARY

This internship report summarizes my experience as an software engineering intern at Neighborly®. It contains the details about what I have done and what practical knowledge I gained during this internship.

Neighborly is a Product based company that provides products as services to its customers. Neighborly was founded in July 2012 in Kansas City, Missouri by Jase Wilson, a civic technologist trained in urban planning at the University of Missouri-Kansas City and the Massachusetts Institute of Technology,. It has 28 plus brands under it , some of the well known are molly maid , 5 Star Painting , The Ground Guys and etc. It has around 50+ employees in Bangalore – India and also contains its branches in USA, Canada , Germany. Today , Neighborly is a family of home service brands that share a commitment to providing you with an outstanding level of service.

My contributions mostly came from the frontend development side which involved building interactive user interfaces using React JS , Vanilla Javascript , Raw CSS and UI libraries like Syncfusion and Material UI and Jest for unit testing and also learned many more tools in this journey. From January , I started with our warm up project , where I was working with 5 other interns making a team of 6. The warm up project (Invoice Audit) was a tool to be built for the company which would be later used by the scrum master. The main reason for building this tool was to remove the manual work done by the scrum master. The problem was that since there are many brands acquired by Neighborly , Mostly at every end of the month , each vendor would sends its invoice data then the scrum master had to manually check if there are any discrepancies and hence to avoid the manual work ,this tool was built. Now in this project I created a vendor form with validation with edit and delete operations using react.js , made a multiple dates selectable calender using syncfusion library which could be later editable , Did 70% of the styling for the entire website using raw css. Later from my second project of opus 2.0 which started in the end of march. I was put into a testing field where I wrote unit test cases for a project called OPUS 2.0 . The main

aim was to increase the unit test coverage of the project which was just 13.1%. So within one and a quarter month I increased its test coverage to 42.5% . Moreover in this journey , I also removed code duplications , code smells , also found potential bugs which were present before. Now recently we just started with our third project called the clickstream stream analysis which was about creating a npm package which would be used by the brands. So in this project , I created the base repo setup for a proper typescript project by configuring the webpack with the important settings and will also do further work once the user stories are assigned to me.

In this internship I got to learn React JS in an advanced level , Swagger along with some component libraries like syncfusion , Material UI from my warm up project. From my Second Project given to me I studied Jest for unit testing , Sonar cloud to write quality code . In this process of development and testing I had to use github a lot so my git skills also got enhanced as I studied and practiced more git commands. Moreover , I also used chatgpt to generate test cases and hence I also came to know when it works well and when it doesn't. I also came to know how the release cycle actually works. Like how the code is processed at each level. Nevertheless , working on different projects helped me sharpen my problem solving skills. Lastly , Even my OOP concepts got more sharpened.

At the same time, I had some challenges in this journey of internship such as initially I was unaware of the daily scrum ceremonies. Secondly from a technological view, writing unit test cases for API calls using Jest was tough due to difficulties in mocking promises and responses received. I am still improving this skill. Using ChatGPT to generate test cases was challenging for longer files with complex logic. When I started with my third project, I didn't know how to set up the project, configure webpack, or manage a good folder structure. Later after referring some online resources I overcame this challenge. Maintaining code with Git was initially challenging due to unfamiliarity with many commands. But with the help of my team members and my mentor I overcame this challenge.

CHAPTER 1 : ORGANIZATION / COMPANY

Neighborly was founded in July 2012 . Neighborly is World's Largest home services franchisor of 28 brands and nearly 5,500 franchises collectively serving 10 million+ customers across various countries.

1.1 BIRDS-EYE-VIEW

Neighborly® stands as a beacon of success in the realm of property repair, maintenance, and enhancement franchising. Originating over four decades ago as Dwyer Group, this company has metamorphosed into the world's largest home services franchisor, boasting an impressive portfolio of 19 brands and nearly 5,000 franchises across nine countries. Its reach extends to over 10 million customers globally, a testament to its unwavering commitment to excellence and customer satisfaction.

At the heart of Neighborly®'s success lies a comprehensive support system for its franchise owners. Through a myriad of resources, including cutting-edge training programs, innovative marketing strategies, and personalized coaching, the company empowers its franchisees to thrive in their local markets. This commitment to nurturing entrepreneurship, while providing a safety net of support exemplifies Neighborly®'s dedication to the success and well-being of its franchise partners.

Beyond its business achievements, Neighborly® prides itself on its close-knit culture and familial atmosphere. Despite its massive scale, the company fosters an environment where franchise owners are not only valued but actively involved in shaping corporate decisions. This collaborative ethos, coupled with a steadfast adherence to its mission, vision, and values, has propelled Neighborly® to the forefront of the franchising industry, setting a standard of excellence for others to

emulate.

1.2 PRODUCTS / SERVICES

Neighborly is a prominent home services franchisor that offers a wide range of products and services through its various brands. Their portfolio includes a comprehensive selection of repair, maintenance, and enhancement services for homes and businesses. Among the services provided are plumbing, electrical work, HVAC maintenance, and cleaning. Neighborly operates through well-known franchises like Mr. Rooter, Mr. Electric, The Ground Guys, and Molly Maid, each specializing in a specific aspect of home care. This extensive network allows Neighborly to meet diverse customer needs, ensuring that homeowners have access to reliable and professional services for almost any home-related issue.

In addition to their core maintenance and repair services, Neighborly also offers niche solutions such as glass repair and restoration through Glass Doctor, and garage door installation and repair via Precision Door Service. These specialized services extend Neighborly's reach, catering to specific home improvement and emergency needs. Furthermore, Neighborly emphasizes quality and customer satisfaction, promoting trust and reliability through its well-trained and certified professionals. By leveraging a network of trusted franchises, Neighborly provides a one-stop solution for homeowners seeking comprehensive home care services, thereby solidifying its position as a leader in the home services industry.

1.3 SECTIONS WITHIN THE ORGANISATION

Entire Neighborly is divided into three main verticals and those are Digital , Onverity and Integration. Besides these there are also other teams such as the system team , Data Analytics

Digital : The customer facing part i.e the official neighborly website , franchise website and the mobile app of neighborly which is directly consumed by the customers is handled by the digital team. The main aim of the digital is to bring all the 28 + brands under a common neighborly theme . A project called OPUS 1.0 handled that job. Till Today most of the brands are on the OPUS 1.0 only two brands have moved into the latest one i.e OPUS 2.0. Technologies Used : Typescript , Tailwind CSS , React Native , Crownpeak, .Net Core , Data Dog , Jest .

Onverity : It is the point of sale where it manages the company's field operations. Since Neighborly has acquired multiple brands, Its current focus is basically to onboard all brands on single FSM platform. Technologies Used are C#.Net , React.js , Syncfusion , Material Ui , Data Dog .

Integration : It basically helps in data migration of data from different brands they owned. The main aim is basically bringing the data of the brands on neighborly platform. The Integration team manages data for all Neighborly brands. Their tasks include acquiring, integrating, and delivering a brand's data throughout Neighborly's infrastructure. The Technologies used are .Net Core , Postgresql , MS SQL .

CHAPTER 2: TASK(S) HANDLED

2.1 Invoice Audit Project

I initially worked in a team of six members for our warm up project i.e The Invoice Audit project wasn't in any of the sections of neighborly. The invoice audit project was basically a tool to be built for the company that the scrum master would use to check the working hours of the employees , their leaves and this would tell the scrum master if the invoice data sent by the vendor every month has any discrepancies or not by pinpointing at that particular employee. Which basically means that it was tool to check if the employee from the vendor company has entered his correct data or not. So the below are the sections where I worked on in the Invoice Audit Project .

- a) Created a vendor form with validations , then sent that data into the database via an api request and displayed the results below in a table through a get request which were again editable.
- b) Integrated different types of APIs requests in different pages. i.e sending data through a post request , getting data from a get request and displaying it on the screen.
- c) Implemented interactive features like popups forms , navigation , onClick events for the user to select a particular country , edit the form and calender.
- d) Created a multiple date selectable and deselectable calendar using syncfusion which would be displayed in a table and could later be edited at any time.
- e) Made 70% of the styling for the entire website .
- f) These included a collapsing sidebar with fade-in and fade-out animations which was written using raw css and not any third party UI libraries.

2.1.2 Increasing test Coverage of OPUS 2.0

My second project was in the digital section where I was given the OPUS 2.0 project. As mentioned above, OPUS 2.0 is a project where we are basically trying to bring our brands from OPUS 1.0 . The unit test coverage of this project was 13.1%. So I was given the responsibility to increase the test coverage. Now in this journey I did the following things :

- a) I increased the test coverage of this entire project from 13.1% to 42.5% in one and a quarter month.
- b) Also found out the potential bugs in this process
- c) Reduced the number of code smells and vulnerabilities which were earlier present.

2.1.3 Clickstream Analysis Project

I recently also started another project called the clickstream analysis project. The project was all about creating a npm package which later will be used by the brands of the company. The npm package will contain all the methods which will be used to basically track the user such as when he arrives , leaves , time spent , new user or not etc where I did the initial set up of the project i.e configuring the webpack , managing proper folder structure for different folders such as src , tests , types etc. Later in future i will also be assigned new tasks on this project once the user stories are made.

2.2 YOUR WORKING SCHEDULE (Date And Time Every Day)

My schedule is five days a week, from 10:00 a.m. to 6:00 p.m.

2.3 TYPE OF TASK(S) YOU WERE EXPOSED TO

- a. I worked on the frontend side, which included building and maintaining the UI using the Typescript , ReactJS framework and Raw CSS.
- b. I was also testing apis in swagger and integrating them into the newly designed user interface.
- c. I worked with version control software like git for code management.
- d) I also experienced unit testing using jest in my second project.

2.4 HANDS-ON EXPERIANCE (Number Of Cases Handled)

- From the warm up project, I got some good experience on React.js and also using some component libraries like syncfusion and material ui.
- From the second project of OPUS 2.0 , I can now confidently write unit test cases using jest without using any resources or help of any AI tool.
- While working on both the projects , I had to use git a lot and now I can easily use and work with advanced git stuff for my code management.
- Used best practices for cross-browser compatibility.
- I could now easily Integrate APIs into any newly designed user interface.
- Since initially I used chatgpt to generate test cases , Now I also understood how to speeden the process of writing code using AI tools like chatgpt and when exactly to use it.

2.5 RELATIONSHIP OF THE TASK WITH THE COURSE YOU STUDIED IN THE CLASSROOM

The skills and knowledge learned in the classroom were useful during the internship in following ways:

- My knowledge of Html , Css , Javascript and React,js from Web Development course helped me design user interfaces and implement interactive features without the need to study again and do it . Example: My strong hand in css led me to write responsive design without using any 3rd party libraries like bootstrap or sementic UI etc.
- Also the knowledge of OOPs concepts used in Java was very helpful as the projects which I handled were mostly in object oriented fashion.
- Moreover, the cypress framework studied from university in the Testing course was very useful for automation.
- Lastly , I could study Jest very quickly since my base in javascript was built very well during the web development course.

Because of this it was easier for me to work and understand the need and to complete the given task.

CHAPTER 3: LEARNING

During my internship, I learned React.js, Jest , Release Cycle , Sonar Cloud , Swagger , UI Component libraries like syncfusion and used ADO for task management. Besides these I also learned to use Chatgpt to generate test cases in order to speeden up the process of unit testing

- **React JS**

React is an open-source front-end JavaScript library. React allows the developer to build a user's interface based on components.

- **Jest**

Jest is an open-source JavaScript testing framework maintained by Facebook. It is designed to ensure the correctness of any JavaScript codebase, making it an ideal tool for testing javascript applications.

- **Sonar Cloud**

Sonar Cloud is an advanced cloud-based platform for continuous code quality inspection and security analysis. It provides developers with insights into their code's health, detecting bugs, vulnerabilities, and code smells. Through automated scanning and feedback, SonarCloud helps teams improve software reliability and maintainability.

- **Chatgpt**

ChatGPT is an artificial intelligence model developed by OpenAI. It generates human-like

text based on the prompts it receives, and can be used for a variety of tasks such as drafting emails, writing code, answering questions, and more.

- **Advanced Git**

As a distributed version control system , Git enables developers to track changes, branch, and merge seamlessly. With its decentralized architecture and robust branching model, Git has become the cornerstone of modern software development workflows.

- **Release Cycle**

The release cycle guides software from development to deployment, managing stages like planning, testing, and delivery. It balances agility and stability, ensuring a structured approach to feature rollouts and bug fixes. Continuous iteration refines the process, adapting to user feedback and evolving requirements.

- **Component Libraries like Syncfusion , Material UI**

Component libraries offer ready-made UI elements for rapid development, ensuring consistency and efficiency across projects.

- **Swagger**

It is an open-source tool that simplifies API development by allowing developers to design, build, document, and consume RESTful web services. It provides an interactive interface that helps developers and testers understand and interact with the API endpoints effectively.

By working on different projects I've got to solve various frontend issues, which increased my problem solving skill.

Collaboration

I collaborated with the backend team to understand API functionality and to use Swagger, and also communicated with other frontend developers to optimize code efficiency. Additionally, I consulted with the product owner about which versions to use and requested license keys for some paid software. This enhanced our workflow and ensured that we were using the best tools and practices aligned with the company.

Project Management

I also learned to use project management tools such as ADO to organize and manage tasks assigned to me efficiently. This experience helped me prioritize tasks, set realistic deadlines, and ensure timely completion. Additionally, I developed better collaboration skills by coordinating with team members and tracking project progress through these tools.

3.2 HAVE YOU HAD AN OPPORTUNITY TO BE INNOVATIVE IN HANDLING TASK(S)? – THE WAY YOU INTRODUCED NEW PRACTICES THAT CUT SHORT THE TIME REQUIRED, ENHANCED QUALITY IN THE OUTPUT, ETC.

While working on the Invoice Audit Tool, I identified that even without using any third-party state management tools like React-Redux or Zustand, we could still handle the entire state of an application very well with the help of the Context API. This allowed me to write less boiler plate code and also reduced the unnecessary work which would have caused if I had by chance used any prop drilling. This approach basically reduced developmental time and increased the code quality.

3.3 HAVE YOU LEARNED SOMETHING ABOUT YOURSELF (YOUR ABILITIES VIS-A-VIS EXPECTATIONS OF YOUR REPORTING OFFICER, YOUR LIKES AND DISLIKES)

Yes, I have learned several things about myself during this period. By using SonarQube extension within Visual Studio Code, I could directly see the bugs, code smells in the code while I was coding. This experience has boosted my confidence in writing quality code independently, even without relying on code analysis tools. Additionally, I have enhanced my Git skills, making me more efficient in version control and collaborative coding environments. I also gained a deeper understanding of the release cycle, including how code is processed at each stage and the operations involved, aligning my abilities more closely with the expectations of my reporting officer.

CHAPTER 4 : CHALLENGES

4.1 SOME TECHNOLOGICAL CHALLENGES FACED

- Testing API Calls: Initially, unit testing API calls using jest was very tough as it was little difficult to mock promises and responses. Currently I am still building that skill.
- Since I was using Chatgpt to generate test cases , one of the challenges faced was that chatgpt couldn't generate proper test cases when the file was longer with complex logic.
- When I had first started the work on my third project of clickstream analysis . I was unaware of how to do the initial project set up for creating a npm package i.e to configure webpack with the right settings , managing a good folder structure . To overcome this I sought guidance from my mentor.
- Maintaining code with Git was a challenge for me at the beginning of the internship. There were a number of git commands that I didn't know. My Mentor was very supportive. He took me through the important Git commands and best practices, which made a huge difference in how I approached version control.

4.2 MEETING DEADLINES

Since we were using Azure DevOps , we could manage and track our stories with timelines . We had to estimate the number of hours needed to finish each task. We had that amount of time to do the work. Occasionally, if by chance we had taken longer than expected to complete a task because of obstacles or problems then it would be a spill over and it had to be completed in the next sprint. To mitigate this, we held regular stand-up meetings to discuss progress and identify any blockers early on.

Appendix I: Samples of the work done

Your hub for Home Services

h

→ Sign in | Join

Dashboard

Vendor Master

Add Holidays

Team Roster

Leave

Invoice Upload

Vendor Form

Vendor Name *

Project Name *

Billable Hours *

Location

ADD

Vendor Name	Project Name	Location	Billable Hours	Actions
-------------	--------------	----------	----------------	---------

Your hub for Home Services

h

→ Sign in | Join

Vendor Form

Vendor Name *

Project Name *

Billable Hours *

Location

ADD

Invalid Billable hours. Hours must be between 1 to 20

Vendor Name	Project Name	Location	Billable Hours	Actions
Vendor ABC	Project ABC	USA	10	

Your hub for Home Services

Sign in | Join

Vendor Form

Edit Vendor Name *

Vendor ABC

Edit Project Name *

Project EFG

Edit Billable Hours *

18

Edit Location

India

UPDATE

CANCEL

Your hub for Home Services

Sign in | Join

Vendor Form

Vendor Name *

Project Name *

Billable Hours *

Location

ADD

Confirm Delete

Are you sure you want to delete ?

YES

NO

Vendor Name		Billable Hours	Actions	
Big Ben		10	 	
Johnson	Johnson Powder	USA	19	 

Home

Calendar

Calendar

Calendar

Calendar

Calendar

Add Holidays

Vendor Name

Garrett Patel

Location

India

June 2024

Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

TODAY

Selected Holidays:

12/06/2024	X
11/06/2024	X
18/06/2024	X
27/06/2024	X

ADD

Increased Unit Test Coverage from 13.1% to 42.5% in One and a quarter month



```

PS C:\Users\Richard.Mascarenhas\OneDrive - Neighborly\Desktop\clickstream sample> npm test -- --testPathPattern=src/tests/clickstream/Clickstream.test.ts

> clickstream-sample@1.0.0 test
> jest --testPathPattern=src/tests/clickstream/Clickstream.test.ts

PASS src/tests/clickstream/Clickstream.test.ts
  Clickstream
    ✓ should initialize with valid parameters (6 ms)
    ✓ should capture events correctly (1 ms)
    ✓ should flush events correctly
    ✓ should set user correctly (1 ms)
    ✓ should unset user correctly (1 ms)
    ✓ should clean up events correctly (1 ms)
    ✓ should handle invalid application parameters or configuration

Test Suites: 1 passed, 1 total
Tests:       7 passed, 7 total
Snapshots:   0 total
Time:        2.278 s, estimated 5 s
Ran all test suites matching /src\\tests\\clickstream\\Clickstream.test.ts/i.
PS C:\Users\Richard.Mascarenhas\OneDrive - Neighborly\Desktop\clickstream sample>

```


Appendix II: Photos while you are at work

