Industry Internship at Zapcom Solutions Pvt. Ltd

An Internship Report for

Course code and Course Title: CSA-652 Industry Internship

Credits: 16

Submitted in partial fulfillment of Master's Degree

Master of Computer Application

by

ADROY FERNANDES

Seat Number: 2205

ABC ID: 262747197858

PRN: 201911501

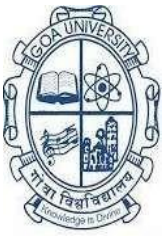
Under the Mentorship of

SANGEET SAMAL

(Lead- QA Engineer at Zapcom)

Goa Business School

Computer Science And Technology



GOA UNIVERSITY

Date: June 2024

Examined by: Seal of the School

DECLARATION BY STUDENT

I hereby declare that the data presented in this Internship report entitled, "Industry Internship at Zapcom Solutions Pvt. Ltd" is based on the work carried out by me at Zapcom Solutions Pvt. Ltd., under the mentorship of Mr. Sangeet Samal (Lead- QA Engineer at Zapcom) and the same has not been submitted elsewhere for the award of a degree by me. Further, I understand that Goa University or its authorities/College will 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 report on the University repository or anywhere else as the UGC regulations demand and make it available to any one as needed.

Date: June 2024 Adroy Fernandes

Place: Goa University Seat no: 2205

OFFER LETTER

zapcom.

2nd January 2024

Mr. Adroy Egidius Fernandes
Mobile # 7249393113

LETTER OF INTERNSHIP

Dear Adroy,

Congratulations!

Consequent to your conversation held with us, we are pleased to offer you an internship as "**Intern**" at Zapcom Solutions Pvt Ltd on the terms and conditions mentioned below:

Current Place of Posting: Bangalore
Stipend: Rs.25,000/- per month
Internship Start Date: 8th January 2024

This internship is for a period of **6 months** and based on your performance the company will evaluate full time opportunity for you with the organization. You are obliged to observe the work regulations in force at Zapcom, as far as the punctual beginning and ending of work within the working hours binding for the employees of Zapcom, the discipline at work and the reliable work performances are concerned.

During that term, company may terminate this agreement for any reason or no reason with fifteen (15) days' notice. The terms of this Agreement shall be governed by and interpreted in accordance with the laws of India.

You will be given a laptop and its accessories during the training in Zapcom. The same will have to be returned by you to Zapcom on completion of the training.

Please sign and return the duplicate copy of this letter in token of your acceptance. We look forward to welcoming you in the organization on **8th January 2024** at 11 am.

Yours faithfully,

For **ZapCom Solutions Pvt Ltd**,

SRINIVAS KOTHAKOTA
COO

Accepted

Adroy Fernandes

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Zapcom Solutions Pvt. Ltd
9th Floor, Gamma Tower, Sigma Soft Tech Park,
Whitefield, Bangalore - 560066
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Zapcom Group Inc.
105 Decker Court, Ste. 810 Irving,
TX 75062.
Ph: (972)441-2081

INTERNSHIP CERTIFICATE

zapcom.

31st May 2024

TO WHOMSOEVER IT MAY CONCERN

This is to inform you that **Mr. Adroy Egidius Fernandes, ZC00607** is currently undergoing internship at our company, **Zapcom Solutions Pvt. Ltd** from 8th January 2024.

During his tenure he has met the expectations of his team lead/mentor/guide and found to be regular and sincere.

This letter is being issued on his request to be submitted with the project report at Goa University.

For Zapcom Solutions Pvt. Ltd.

Srinivas Reddy Kothakota
Chief Operating Officer

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Zapcom Solutions Pvt. Ltd
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COMPLETION CERTIFICATE

This is to certify that the internship report “Industry Internship at Zapcom Solutions Pvt. Ltd” is a bonafide work carried out by Mr Adroy Egidius Fernandes under my mentorship in partial fulfillment of the requirements for the award of the degree of Masters of Computer Applications in the Discipline of Computer Science And Technology at the Goa Business School, Goa University.

(Signature and Name of Mentor)

Date: June 2024

(Signature of Dean) (School Stamp)

Date: June 2024

Place: Goa University

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to the following individuals and teams for their invaluable support, guidance, and encouragement throughout my internship at Zapcom Solutions.

I am immensely grateful to Mr. Kishore Pallamereddy for providing me with the opportunity to intern at Zapcom Solutions. His vision and leadership have created a dynamic and enriching work environment that fosters growth and learning.

I extend my heartfelt thanks to Mr. Manjunat Sirur, under whom I completed my baseline training, and Mr. Sangeet Samal, my mentor for QA training, for their dedicated mentorship and guidance. Their expertise and insights have been instrumental in shaping my skills and knowledge during the internship.

I would like to express my appreciation to the HR and Finance teams at Zapcom Solutions for their assistance throughout the internship. Their support in administrative matters and ensuring a smooth internship experience is highly valued.

A special thanks to Mr. Akash S, QA Engineer at Neighborly, under whom I shadowed for the client project. His training and guidance were crucial for me to create a significant impact and achieve the project outcomes.

My sincerest gratitude to my colleagues and teammates for their continuous support and guidance throughout my internship. Their collaborative spirit and willingness to assist have been invaluable.

I am thankful to Goa Business School, especially the faculty of Discipline of Computer Science And Technology for their support , encouragement, and providing me with the opportunity to undertake this internship.

Lastly, I would like to acknowledge the entire Zapcom Solutions team for creating an inclusive and motivating environment that has significantly contributed to my professional growth.

EXECUTIVE SUMMARY

Zapcom Solutions specializes in software development, data engineering, and quality assurance. Known for its innovative approach and cutting-edge solutions, Zapcom Solutions has established itself as a dynamic workplace fostering professional growth and continuous learning. During my internship, I had the opportunity to work in a collaborative environment where creativity and technical skills were highly encouraged. The company's emphasis on agile methodologies and client-centric solutions provided me with a comprehensive understanding of industry best practices and project lifecycle management.

Throughout my internship, I was involved in a variety of tasks that contributed to my holistic development as a software development engineer in testing . I started with foundational training in SQL and PostgreSQL, which included writing and executing queries, and advanced database management. A significant part of my role involved shadowing a QA Engineer on a client project, where I worked on developing python scripts for data validation automation and validating data migration , ensuring data integrity between different systems. Additionally, I participated in API testing using Postman and managed project tasks through Azure DevOps.

The internship at Zapcom Solutions was a profound learning experience that enhanced my technical and soft skills. I gained a solid understanding of SQL, PostgreSQL, and advanced database concepts, which were pivotal in data migration tasks. My exposure to quality assurance and software testing fundamentals, including writing test cases and API testing, enriched my

knowledge in ensuring software reliability. The agile process taught me the importance of iterative development and collaboration. Furthermore, I honed my Python programming skills, particularly with the Pandas library for data manipulation and analysis. The internship also significantly improved my communication, problem-solving, teamwork, and presentation skills, which are crucial for professional growth.

During my internship, I encountered several challenges that tested my adaptability and problem-solving abilities. Setting up project environments and tools required meticulous configuration and troubleshooting to ensure compatibility with existing systems. Database authentication posed difficulties, especially with multiple databases requiring different authentication protocols. Working remotely added a layer of complexity to communication and collaboration, which I overcame by utilizing Microsoft Teams for regular check-ins and meetings. Understanding complex database architectures and project-specific workflows demanded focused effort and extensive knowledge transfer sessions. Additionally, developing and debugging scripts for data validation involved overcoming numerous errors and unexpected behaviors. Managing multiple tasks and deadlines required effective time management, often leading to extended work hours and weekends to meet project goals.

CONTENTS

CHAPTER 1: ORGANIZATION/COMPANY

1.1 Birds-Eye View of ZapCom Group

Zapcom Group stands as a global frontrunner in product engineering and technology services, dedicated to designing and developing custom software solutions that enable partners to achieve their business goals. Specializing in building scalable platforms for the Travel, Hospitality, Fin-Tech, and Retail industries, Zapcom is renowned for its high-performing team adept at leveraging disruptive innovative ideas and emerging technologies. Headquartered in California, with additional offices in Dublin, Dallas, Bangalore, Hyderabad, and San Jose, the company has a strategic global presence that facilitates close collaboration with clients worldwide. Zapcom's strong management team boasts extensive experience in technology consulting, product engineering, and custom solution development, making the company exceptionally positioned to drive digital transformation and enhance delivery efficiency for its clients.

1.2 Products and Services of ZapCom Group

ZapCom Group offers a comprehensive suite of products and services designed to help businesses thrive in a digital world. Their core offerings include custom software development, scalable platform creation, and cutting-edge technology solutions tailored to the specific needs of the Travel, Hospitality, Fin-Tech, and Retail sectors.

In the realm of data solutions, ZapCom excels in transforming raw data into valuable insights. Their services include data migration, engineering, visualization, and machine learning (ML) engineering, helping businesses harness the power of data to drive

decision-making and innovation. Their cloud platform services focus on optimizing performance, reliability, and cost-efficiency, with expertise in cloud-native development, app modernization, and cloud transformation. Additionally, ZapCom's enterprise asset management services enable businesses to integrate multiple facets of their operations, fostering reusable technical assets that deliver consistent innovation.

One of their standout projects, AI Model Life Cycle Management, showcases their ability to develop sophisticated machine learning platforms that enhance product and service quality in the hospitality industry. By employing Agile and Scrum methodologies, ZapCom ensures that their project delivery is not only efficient but also adaptive to the changing needs of their clients, ultimately driving measurable business value and competitive advantage

1.3 Organizational Structure and Organogram of Zapcom

Zapcom Group's organizational structure is designed to foster innovation and efficiency, with dedicated teams specializing in various aspects of product engineering and technology services. The leadership team, headed by Founder and CEO Kishore Pallamreddy, includes key figures such as Sai Konda (Chief Information Officer), Srinivas Kothakota (Chief Operating Officer), Deepak Puranam (Chief Product Officer), Paul Lehman (Chief Commercial Officer), Kumar Saurabh Johny (Head of Innovation and AI Strategy) and Pooja Parthi (Head of HR). The board of advisors and directors, featuring industry experts like Jim Fitzpatrick and Joan Khuel, provide strategic guidance.

ZapCom's internal structure is divided into several key departments, each specializing in critical areas of the business. These include Product Development, where innovative software solutions are conceptualized and built; Data Solutions, which focuses on data engineering and analytics; Cloud Platforms, dedicated to optimizing cloud infrastructure and

services; and Enterprise Asset Management, which handles the integration and management of business operations. Each department is staffed with skilled professionals who are committed to delivering high-quality solutions and achieving client satisfaction.. This structured yet flexible organization ensures ZapCom can swiftly adapt to the evolving needs of its clients and the market.

CHAPTER 2: TASKS HANDLED

2.1 Chatbot Deck

During this task, I researched and understood the client's application, explored how chatbots are created, and identified potential features and functions. Combining these insights, I and my other colleague created a comprehensive presentation deck intended to enhance the client's application, although it was not ultimately presented to the client.

We used Google Slides to create the presentation deck and I was able to apply learnings from my NLP and DL classes.My working schedule for this task spanned from 25th January to 31st January during normal working hours (9:00 AM - 6:00 PM). But, due to the novelty and complexity of the tasks, I extended my work into weekends and overtime.

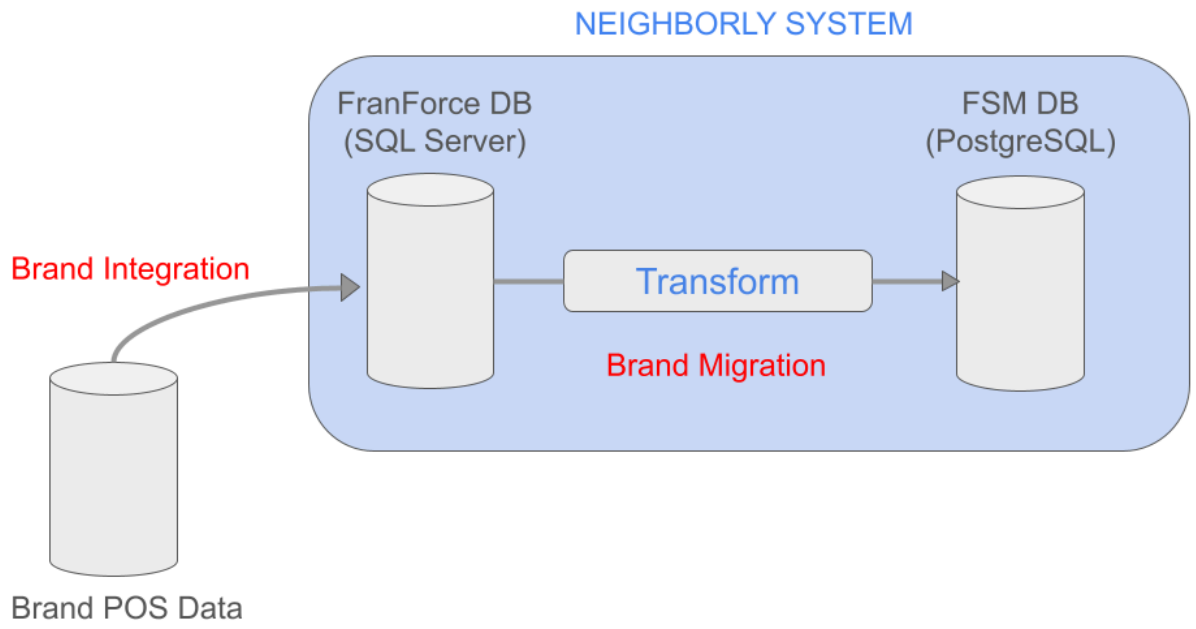
2.2 Neighborly Project - Brand Integration and Migration

Neighborly owns several brands and is in the process of developing its own Point of Sale (POS) application, called Field Service Management(FSM), to be used across all its brands. Currently, each brand operates its own distinct POS system. The Brand Integration Team (BIT) is responsible for integrating data from these individual POS systems into the new NBLY system. This complex process involves preparing data for downstream applications and ensuring data integrity and accuracy throughout the integration and migration phases. The team must work with multiple data sources to ensure a seamless transition into the existing system, addressing challenges related to data consistency, quality, and system compatibility.

2.2.1 Software used and Technical Setup:

The technical setup included a custom testing framework developed using Python and its libraries. Visual Studio Code (VS Code) was used as the primary editor for writing automation test scripts. Database management was handled using SQL Server Management Studio (SSMS) and PostgreSQL. Azure DevOps was employed for project management. And access to various development tools and resources obtained as needed.

2.2.2 Activities carried out by BIT:



Brand Integration: When a brand is taken up for integration into Neighborly's Field Service Management (FSM) system, the first step involves integrating its POS data into the NBLY database (Franforce - SQL Server) and setting up periodic synchronization. The QA team ensures correct data mapping to the tables and fields in the Franforce database, verifying mappings against the initial requirements and analysis phase.

Brand Migration: Once data is in Franforce, it must be transformed and prepared for the FSM system, which uses PostgreSQL as its database. BIT handles the transformation and migration of data from Franforce into the PostgreSQL database, ensuring correct mappings and transformations per the mapping sheet.

2.2.3 My role and work carried out:

As a shadow resource and Software Development Engineer in Test (SDET), my responsibilities included understanding migration requirements, final data forms, and the testing process. After validating data for 1-2 business units (BUs) manually, I developed an automation script to streamline the process for remaining BUs. Data validation tasks involved checking for counts, missing records, duplicate entries, and data inconsistencies. Discrepancies were investigated to determine if they were bugs.

2.2.4 Script Development:

The initial automation script was incomplete and couldn't handle all validations varying by brand. I identified its drawbacks, received input from my reporting manager, and developed a new script. The main script was common, with brand-specific subscripts for particular validations. Key functionalities included creating and executing queries dynamically, transforming records for target system compatibility, and validating data integrity using the mapping sheet. Pandas library was used for handling query data, transformations, and comparisons. Continuous debugging and testing ensured the accuracy of the testing script.

2.2.5 Team Collaboration:

Collaborated closely with team members, including senior developers, senior Qa Engineer. Regular meetings and planning sessions were held to discuss progress, challenges, and next steps.

2.2.6 Outcomes and Deliverables:

Successfully completed the validation script for one brand, with the second one in progress. Manual process of Validation was Time consuming and It used take time of 5-6 Bu validation per day but After introducing Automation script increased number of bu validation by 50% and more Detailed error report and Debugging time

2.2.7 Reflection and Learning:

Gained hands-on experience in data migration, ETL processes, and Python scripting. The project reinforced the practical application of data engineering and software development concepts learned during coursework.

2.2.8 Working Schedule:

- March 7 - March 14: Project onboarding, installations, and setup
- March 18 - March 24: Understanding code scripts and KT sessions
- April 01 - April 05: Understanding code flow and database architecture
- April 08 - May 31: Parallel development of automation scripts , understanding requirements , getting hands on experience with manual validations on data migration

2.3 Zapminds

2.3.1 About Zapminds

Zapcom firmly believes that innovation is the key to their culture and growth. To foster groundbreaking ideas and transform them into tangible products, they have launched Zapminds -an initiative dedicated to nurturing innovation within the organization. The goal is to empower their workforce to generate innovative ideas and bring them to life. The Ideathon marks the beginning of this journey, with selected ideas progressing to the Hackathon and eventually materializing through the collaborative efforts of the Zapminds community.

The objectives are to collectively produce innovative solutions, ignite entrepreneurial spirit, and offer practical business solutions for real-world challenges and build intellectual property (IP) to shape up into exciting products.The spotlight of this event is on leveraging Generative AI foundational paradigms to address real-world problems within the Travel & Hospitality, FinTech, Retail, and Healthcare sectors.

2.3.2 Zapminds Ideathon

During the Zapminds Ideathon from 21st to 23rd February 2024, I played an active role in brainstorming and developing ideas, conducting market research, and preparing a pitch. Working alongside a team of 6 interns, 1 senior developer, and 1 lead, we successfully pitched our idea and secured 2nd place among 13 teams, demonstrating our innovative approach and teamwork. The process included initial idea generation on 21st February, half-day brainstorming and research on 22nd February, and intense ideation and pitch

preparation on the final day, 23rd February. We used Canva to prepare our presentation, and our performance qualified us for the top 5 teams that advanced to the Hackathon.

2.3.2 Zapminds Hackathon

In the Zapminds Hackathon on 5th and 6th April 2024, we created a full-stack application with an integrated ML model. My contributions focused on model training, backend development, and integration. On 5th April, I spent the first half of the day learning Flask and then worked on development for the remaining time. Working overnight, our team developed the project and presented a final demo on the evening of 6th April. Competing against more experienced teams, we secured 2nd place out of 5 teams, showcasing our ability to rapidly develop and deliver a high-quality project under tight deadlines. I applied data science and ML techniques learned during coursework, using a dataset from Kaggle for model training and Google Colab for EDA and model training. For backend development, we used Python (Flask) and leveraged libraries like Pandas, Scikit-learn, NumPy, and Pickle for data processing, model training, and saving the model.

CHAPTER 3: LEARNINGS

3.1 SQL Basics

My internship began with baseline training, where I completed a Udemy course on SQL basics from January 9th to January 12th. This course provided me with a foundational understanding of SQL and RDBMS concepts, teaching me how to write and execute basic queries for retrieving, inserting, updating, and deleting data in databases. Additionally, I learned about joins, subqueries, grouping, and aggregates

3.2 Dashboard designing

I started a Udemy course on dashboard designing in parallel with SQL from January 9th to January 12th. In this course, I learned about effective layout design, color theory, Gestalt principles, and how to tell a story through visuals to ensure a great user experience. However, I had to discontinue this course and focus fully on SQL, so I couldn't gain hands-on experience in dashboard designing.

3.3 PostgreSQL Basics to Advance

After completing the basic SQL course, I moved on to an advanced PostgreSQL course on Udemy, which ran from January 17th to February 16th. During this period, I delved into intermediate topics such as sequences, arrays, JSON, regular expressions, and SQL functions (numeric, string, conditional, date, and time). I also covered advanced topics like views, PL/pgSQL, stored procedures, triggers, transactions, CTEs, set operations, aggregate and window functions, cursors, table partitioning, and indexing.

3.4 QA & Software testing Fundamentals

Due to a requirement in QA, my training shifted to this domain. From February 19th to March 7th. I developed a solid understanding of quality assurance and software testing principles, including different types of testing (unit, integration, system, and acceptance), writing test plans and test cases, and various testing methodologies to ensure software quality and reliability

3.5 Agile process

Since the company followed the Scrum process in the project lifecycle, I started learning about the Agile methodology alongside my QA training. Agile emphasizes iterative development, collaboration, and flexibility. Once I was onboarded onto the client project, I participated in sprint planning, daily stand-ups, sprint reviews, and retrospectives, gaining hands-on experience in how Agile processes help deliver high-quality software in a timely manner.

3.6 Writing Test cases

Through assignments given by my mentor and co-guide, I learned how to write comprehensive and effective test cases that cover various scenarios and edge cases. This involved understanding the requirements, defining test objectives, and creating detailed steps and expected results to ensure thorough testing of the application.

3.7 Postman (API testing)

While working on a client project, I used Postman for API testing, which included sending requests to API endpoints and validating responses. This experience helped me understand how to test RESTful services and ensure that APIs function correctly and efficiently.

3.8 Azure Devops

I gained exposure to Azure DevOps for project management, which included managing work items and collaborating with team members using Azure Boards and Repos. This experience helped streamline the development process and maintain project organization.

3.9 Python scripting and Pandas

I honed my Python programming skills, particularly using the Pandas library for data manipulation and analysis. This involved writing scripts to clean, transform, and analyze data, as well as automating repetitive tasks, enhancing my ability to handle large datasets and validate migrated data effectively.

3.10 Other Skills

3.10.1 Communication skills

I improved my communication skills through regular team meetings, presentations, and client interactions. This involved articulating technical concepts clearly and concisely, both in written and verbal forms.

3.10.2 Problem solving

My problem-solving skills were enhanced by tackling various technical challenges and finding efficient solutions. This included debugging code, optimizing queries, and resolving data inconsistencies.

3.10.3 Team-work

Working closely with a diverse team helped me develop strong teamwork skills. I learned the importance of collaboration, mutual support, and leveraging each team member's strengths to achieve common goals.

3.10.4 Presentation

I gained experience in creating and delivering presentations. This included using tools like Google Slides and Canva to design engaging slides and presenting complex technical information in an understandable and professional manner to different audiences.

CHAPTER 4: CHALLENGES

When I joined a client project, setting up project environments and tools was one of the initial challenges I encountered. This process involved configuring multiple development environments, installing necessary software, and ensuring compatibility with existing systems. To tackle this, I meticulously followed documentation, sought assistance from team members and the IT support team, and utilized online resources to resolve any setup issues efficiently.

Next, database authentication presented a significant challenge, particularly with multiple databases like SQL Server and PostgreSQL, one of which used Windows authentication for connection. I had multiple Microsoft accounts (one provided by the company and another for the client project). Ensuring proper access permissions and secure connections required careful attention to detail. I resolved these issues by collaborating with database administrators, understanding authentication protocols, and configuring the necessary credentials correctly.

Working remotely added a layer of complexity to communication and collaboration. To overcome this, I made extensive use of Microsoft Teams for regular check-ins and meetings. I ensured availability during core working hours for immediate assistance or discussions, and also post working hours when necessary to connect with teammates or the US team.

Gaining a comprehensive understanding of the database architecture was the next big challenge, essential for accurate data integration and migration. This required studying database schemas, relationships, and data flows. I spent significant time, including overtime,

reviewing documentation, attending knowledge transfer (KT) sessions, and consulting senior team members to build a clear understanding.

Onboarding and quickly grasping the project-specific workflows and requirements demanded focused effort. I tackled this by actively participating in KT sessions, making myself available whenever my teammates and mentors were available, asking questions, and documenting processes. Creating detailed notes and flowcharts helped me understand and remember the intricate details of the workflows.

Effective coordination with team members and mentors was vital for knowledge transfer and project success. I ensured regular communication through scheduled meetings, email updates, and instant messaging on Teams. Actively listening and engaging in discussions during these interactions helped me gain valuable insights and clarify doubts.

Developing and debugging scripts, particularly for data validation and migration tasks, was a challenging yet crucial part of the internship. I faced numerous script errors and unexpected behaviors. Developing these scripts was my favorite part because it allowed me to apply my problem-solving skills. To address the issues, I adopted a methodical approach to debugging, utilizing print statements, logging, and leveraging IDE features to trace and resolve issues effectively.

During data validation, encountering discrepancies and missing records was common. To address this, I developed a systematic approach to identify and resolve these issues. This involved detailed analysis of data mappings, using SQL queries to trace data flows, and collaborating with the development team to pinpoint and fix the root causes.

Unexpected technical issues often arose, requiring innovative solutions. For instance, handling, transforming, and comparing large datasets during validation scripts posed challenges. I optimized the scripts by incorporating efficient algorithms and leveraging

libraries like Pandas for better performance, readability, and effectiveness, which was difficult using traditional arrays and lists.

Being part of a small QA team with only two members posed its own set of challenges. With limited resources, we had to be highly efficient and manage our workload effectively. We divided tasks based on our strengths and maintained clear communication to ensure that all testing and validation activities were covered comprehensively. This experience enhanced my ability to work independently and collaboratively in a resource-constrained environment.

Managing time effectively while juggling multiple tasks and adhering to deadlines was a continuous challenge. Our team used Azure DevOps Boards to prioritize and track tasks. Setting clear goals for each sprint, along with regular check-ins with my mentor and daily standup meetings, helped me stay on track and meet deadlines. Despite this, I occasionally struggled with time management and had to work overtime and even on weekends to get things done on time.

Adapting to new tools and technologies was another challenge. I dedicated time to learning these technologies through online courses and practical implementation. By working on small projects and gradually integrating these tools into the main project, I was able to adapt and apply them effectively. Learning Flask for the Zapminds Hackathon was a steep learning curve. I focused on self-study, using online tutorials, and hands-on practice to understand Flask’s framework. I didn’t cover everything but concentrated on the concepts I knew I would require during the hackathon. Implementing Flask in the hackathon project under tight deadlines helped reinforce my learning through practical application.

APPENDIX I

Photos at Workspace

Zapcom Bangalore Office

Zapcom Accessories

Working !

Zapminds Hackathon Runners-Up

Celebrations 🎉 🎊