INTERNSHIP REPORT

RUSHIKESH ARLEKAR

1902

ZapCom Solutions Pvt. Ltd. **Goa University**

REPORT OF INTERNSHIP DONE AT ZAPCOM SOLUTIONS PVT. LTD

SUBMITTED BY

RUSHIKESH RAVI ARLEKAR

1902

For the course

MCA Semester VI

Goa Business School, Goa University

At

ZapCom Solutions Pvt. Ltd

UNDER THE GUIDANCE OF

Mr. Abhinandan Khajuria

(Software Engineer, ZapCom)

Mr. Digvijay Solanki

(Software Engineer, ZapCom)

With

Mr. Manikanta Garikipati

(Solutions Architect, Zapcom)

zapcom.

3rd June 2022

INTERNSHIP LETTER

This is to certify that **Mr. Rushikesh Ravi Arlekar**, student of MCA, 6th Semester from Goa University is working as an Intern with our Organization at Bangalore location since 10-Jan-2022, his six months internship period will get over on 30- June-2022.

During the period of his Internship program with us, he is found punctual, hardworking, and inquisitive.

We wish him s successful career ahead.

Yours Sincerely,

For **ZapCom Solutions Pvt Ltd**.

SRINIVAS KOTHAKOTA COO

GOA UNIVERSITY

GOA BUSINESS SCHOOL

CERTIFICATE OF EVALUATION

This is to certify that **Mr. Rushikesh Ravi Arlekar** has been evaluated for the project work titled "**Report of Internship done at ZapCom Solutions Pvt. Ltd**" undertaken at **ZapCom Solutions Pvt. Ltd., Bangalore, Karnataka,** in partial fulfillment for the award of the degree in Master of Computer Application.

_____ _____

Examiner 1 Examiner 2

Place: Goa University

Date: 11/06/2022

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Dean, Goa Business School

Acknowledgement

Interning in a company is a golden opportunity for learning and self-development especially 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. Kishore Pallamreddy (CEO, ZapCom) for giving me the opportunity to intern at ZapCom. My sincerest gratitude to Mr. Manikanta Garikipati (Solutions Architect, ZapCom) and Mr. Abhinandan Khajuria (Software Engineer, ZapCom), and Mr. Digvijay Solanki (Software Engineer) for being my mentors and giving me the necessary guidance and support.

I would like to extend my gratitude to Ms. Shilpi Jalota (HR Manager, ZapCom) and Vanessa Regina Castro (Associate HR Generalist) for always helping me out whenever I was in dire need.

I thank Mr. M. S. Dayanand (Dean, Goa Business School, Goa University), Mr. Ramdas Karmali (Prof. and TPO, MCA, Goa Business School, Goa University), Ms. Jyoti Pawar (Program Director, MCA, Goa Business School, Goa University), Mr. Jarret Stevan Anthony Fernandes (Assistant Prof, MCA, Goa Business School, Goa University) and all the faculty of MCA, Goa University for their constant encouragement and support during the project work.

I would like to thank my family and friends for allowing me to go so far away from them and those friends in Bangalore who made me feel comfortable in a new location. The love, support, and encouragement they provided me during this internship cannot be forgotten.

Finally, I would like to express my gratitude to the ZapCom family who was always ready to help me and guide me in all aspects of life. They have transformed me into a new and renewed person ready to face head-on any challenges that come my way.

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Introduction

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

I joined as an Intern at ZapCom on 10th January 2022 and have been here since then. This report contains necessary information about the organization, the POC project I worked on, and the other tasks and training 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 project I worked on, 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 be talking about the tools and technologies that were used followed by my internship timeline.

I shall conclude by sharing my experience and how it has helped me to grow, both, on the personal and professional front.

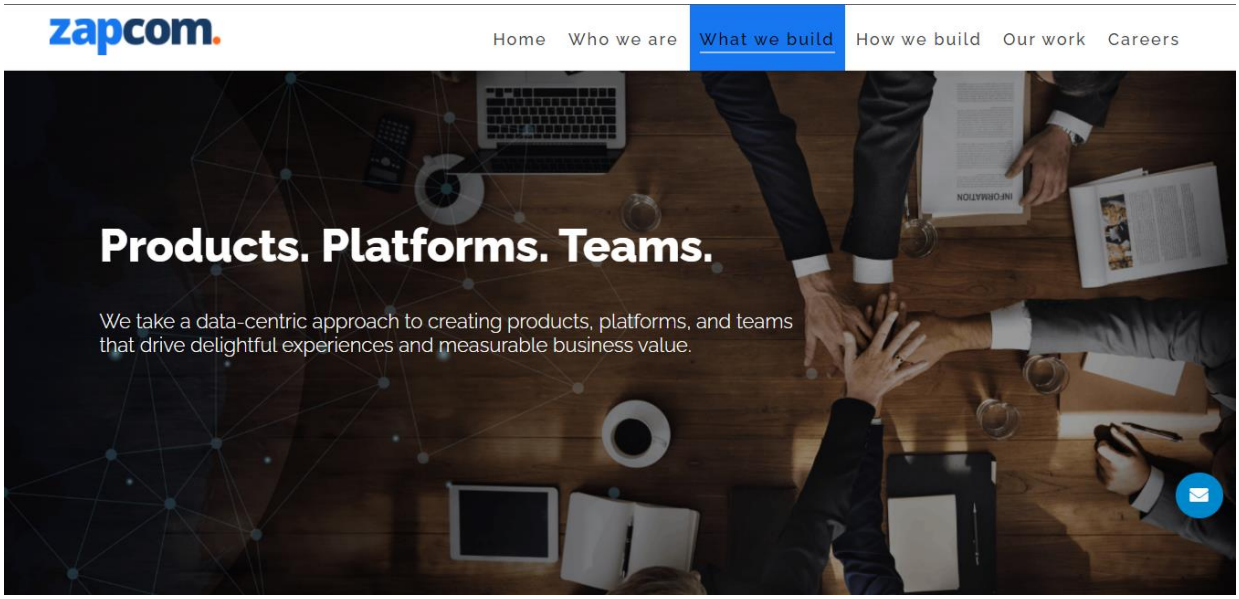
Company Profile

ZapCom Group is a US based Product and technology Start-up, focusing on Travel, Hospitality, and Retail domains.

ZapCom is a Venture floated by a couple of KEY global leaders who had led MNC's globally and worked in the US for over 20 years.

The KEY areas of focus for ZapCom are:

- Standing up or realizing start-up ideas in the technology space by investing in Innovative ideas - mainly from Silicon Valley and Bangalore
- End-to-End Solutions with cutting edge technologies and custom App development focused on onshore-offshore delivery model.



ZapCom is a self-sufficient and well-funded venture by our own founders and is a debt-free organization.

ZapCom provides best-in-class technology solutions at the RIGHT COST on a Global Scale. With extensive experience in understanding the digital economy, ZapCom is strategically placed to help clients deliver better products, services, and business processes through Disruptive Technologies, Insights & Processes.

By hiring the right people, motivating them to give their best, and fostering an environment of continuous learning, innovation, mutual trust, and fun, we are able to achieve exceptional productivity and results.

Learnings

Self Learning

- Java Features
- Spring Boot Features
- Junit Testing with Mockito
- Multithreading
- JWT Authorization and Authentication
- Circuit Breakers
- Spring Data JPA (MySQL)
- Spring Cloud
    - API Gateway
    - Cloud config
- Spring Boot Microservice Architecture
- Dockerization
- AWS
    - EC2
    - RDS (MySQL)

Udemy Courses

- Django Beginners Course
- Django Advance Course (ongoing)

Tasks Performed as Self Learning

Java practice tasks

- Java Basics
    - Practiced basic concepts of Java
- Multithreading
    - Practiced how multithreading, synchronization, and future objects work in java
- Unit Testing
    - Practiced unit testing with mockito framework
- Spring Boot REST API
    - Build a REST API with Spring Boot Microservice framework
- Spring Boor Discovery Server
    - Implemented discovery server with the REST API
- Spring Boot Config Server
    - Implemented config server with the REST API
- Dockerization
    - Building docker images of Spring Boot API's

Django Practice Task

- Database Migration
    - Built Database migrations by creating modals and custom migrations
- REST API
    - Built REST API with Django and Admin login

Work Environment-related Methodologies

Daily stand up

We have daily stand up meetings where every team member tells what they have accomplished from the last daily stand up, what they plan to do for the next meeting, and what obstruction they have in their way.

Weekly Catchup

During the weekly catchup calls all team members discuss what they have achieved/accomplished in that week with some casual chat.

POC Project (Spring Boot) - Music Library

Problem Statement and Overview

Developing two microservices and showing their intercommunication. A User service and Music library service. In which a registered user should be able to read, add, and modify music details from an external service.

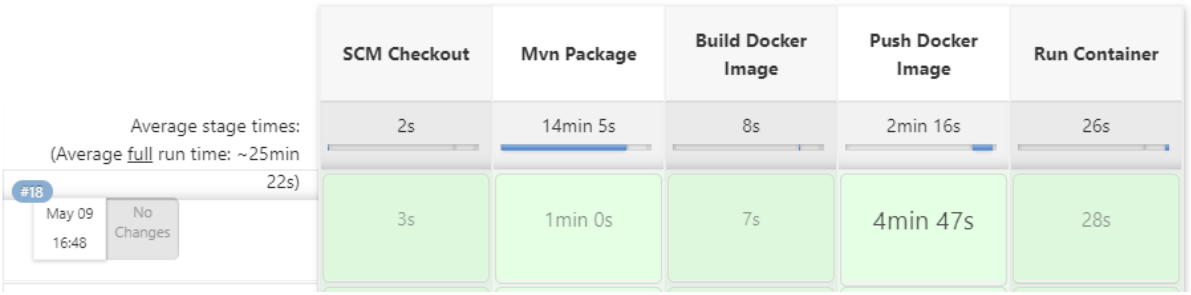
Tools and Technologies used

- MySQL
- Java
- APIs in Spring Boot
- Spring Data JPA
- Spring AOP
- Spring Cloud Config
- Spring Cloud Gateway
- JWT
- ORM (Hibernate)
- Sonar Lint
- Spring/ Java Testing and Mocking
- Jacoco code coverage
- Postman
- Docker
- AWS (EC2)
- AWS RDS (MySQL)
- Jenkins
- GitLab

My Contribution

I worked on the following things

- Built the APIs with crud operations and user-defined queries
- Implemented Authentication with JWT token
- Built the API Gateway (spring cloud gateway and Zuul API gateway)
- Built the Config server (Spring Cloud Config) and Discovery server (Eureka Discovery Server)
- Configured the database using Spring Data JPA and Hibernate ORM and handled Entity Relationships using Spring Data REST
- Wrote unit test cases for every class
- Built CICD Pipeline in Jenkins and GitLab Repository



- Built the docker images of the services and gateways using Docker files
- Built MySQL docker image and deployed the API services along with MySQL using docker-compose
- Deployed API with remote AWS RDS MySQL database to Docker-Hub on remote AWS EC2 instance

New Technologies and Tools

Java

Java is a popular programming language.

Java is used to develop mobile apps, web apps, desktop apps, games, and much more.

Spring Boot Framework

Spring Boot is an open-source Java-based framework used to create a micro Service. It is developed by the Pivotal Team and is used to build stand-alone and production-ready spring applications. This chapter will give you an introduction to Spring Boot and familiarizes you with its basic concepts.

Spring Data

Spring Data's mission is to provide a familiar and consistent, Spring-based programming model for data access while still retaining the special traits of the underlying data store.

It makes it easy to use data access technologies, relational and non-relational databases, map-reduce frameworks, and cloud-based data services. This is an umbrella project which contains many subprojects that are specific to a given database.

Spring Cloud

Spring Cloud is a collection of ready-to-use components which are useful in building distributed applications in an enterprise. As a framework, it is widely used across industries by various companies and includes integration with OSS components from Netflix.

The major use-case for Spring Cloud is the ready-to-use solution that it provides to common problems observed in distributed environments like load balancing, service discovery, circuit breaking, etc., which can easily be integrated into an existing Spring project.

MySQL

MySQL tutorial provides basic and advanced concepts of MySQL. Our MySQL tutorial is designed for beginners and professionals.

MySQL is a relational database management system based on the Structured Query Language, which is the popular language for accessing and managing the records in the database. MySQL is open-source and free software under the GNU license. It is supported by Oracle Company.

MySQL Workbench

MySQL Workbench is a unified visual tool for database architects, developers, and DBAs. MySQL Workbench provides data modeling, SQL development, and comprehensive administration tools for server configuration, user administration, backup, and much more. MySQL Workbench is available on Windows, Linux, and Mac OS X

IntelliJ Idea

IntelliJ is one of the most powerful and popular Integrated Development Environments (IDE) for Java. It is developed and maintained by JetBrains and available as a community and ultimate edition. This feature-rich IDE enables rapid development and helps in improving code quality.

JWT Authentication

JSON Web Token (JWT) is an open standard (RFC 7519) that defines a compact and self-contained way for securely transmitting information between parties as a JSON object. This information can be verified and trusted because it is digitally signed. JWTs can be signed using a secret (with the HMAC algorithm) or a public/private key pair using RSA or ECDSA.

SonarLint

SonarLint is a free IDE extension to find and fix bugs, vulnerabilities, and code smell as you write code! Like a spell checker, SonarLint highlights issues on the fly and provides quick fixes or clear remediation guidance to help you clean the code before it is even committed. With support for several popular and classic languages, SonarLint helps developers of all experience and skill levels write efficient, safe code.

Jacoco Code Coverage

Jacoco is an open-source project, which can be used to check production code for test code coverage. It creates reports and integrates well with IDEs like the IntelliJ Idea. Integration is also available for other IDEs and continuous integration environments. So there are also Gradle, SonarQube and Jenkins plugins to make these code coverage checks outside the IDE and therefore globally available to the development team.

Junit 5

This JUnit 5 tutorial talks about how JUnit adapted the Java 8 style of coding and several other features. Learn how JUnit 5 is different from JUnit 4.

JUnit 5 is the most widely used testing framework for Java applications. For a very long time, JUnit has been doing its job perfectly.

Mockito

The Mockito tutorial provides basic and advanced concepts of the Mockito framework. Our Mockito tutorial is designed for both beginners and professionals. It will help you to learn and create unit tests using the Mockito framework.

Mockito is a mocking framework. It is a Java-based library used to create simple and basic test APIs for performing unit testing of Java

applications. It can also be used with other frameworks such as JUnit and TestNG.

Git

Git is a free and open-source distributed version control system designed to handle everything from small to very large projects with speed and efficiency.

GitLab

GitLab is an open source end-to-end software development platform with built-in version control, issue tracking, code review, CI/CD, and more. Self-host GitLab on your own servers, in a container, or on a cloud provider.

Hibernate

Hibernate is a Java framework that simplifies the development of Java applications to interact with the database. It is an open-source, lightweight, ORM (Object Relational Mapping) tool. Hibernate implements the specifications of JPA (Java Persistence API) for data persistence.

Postman

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.

Docker

Docker is an open platform for developing, shipping, and running applications. Docker enables you to separate your applications from your infrastructure so you can deliver software quickly. With Docker, you can manage your infrastructure in the same ways you manage your applications. By taking advantage of Docker's methodologies for shipping, testing, and deploying code quickly, you can significantly reduce the delay between writing code and running it in production.

Amazon EC2

Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 eliminates your need to invest in hardware upfront, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

Amazon RDS MySQL

MySQL is the world's most popular open source relational database and Amazon RDS makes it easy to set up, operate, and scale MySQL deployments in the cloud. With Amazon RDS, you can deploy scalable MySQL servers in minutes with cost-efficient and resizable hardware capacity.

Jenkins

Jenkins is an open-source automation tool written in Java with plugins built for Continuous Integration purposes. Jenkins is used to building and testing your software projects continuously making it easier for developers to integrate changes to the project, and making it easier for users to obtain a fresh build. It also allows you to continuously deliver your software by integrating with a large number of testing and deployment technologies.

Internship Timeline

January 2022

- **Week 1**
  - Formal Orientation
- **Week 2**
  - Learned Java Basics
  - Learned Java Collection framework
  - Explored IntelliJ Idea
- **Week 3**
  - Explored Java 8 features
  - Practiced Java

February 2022

- **Week 1**
  - Explored multithreading
    - Synchronous/Asynchronous
    - Locking
    - Concurrency
    - Completable Future
  - Practiced Multithreading
- **Week 2**
  - Learned Junit 5
    - Test Lifecycle
    - Architecture
    - Assertion and assumptions
    - Exception Testing
  - Learned about Mockito
    - Mocking
    - Injecting Mock Objects

        - Captor Arguments
    - Practiced Junit Testing with Mockito

- **Week 3**
    - Introduction to Spring Boot
        - Spring Boot Architecture
        - Spring Boot Data JPA / Data JDBC
        - REST API
        - Authentication Manager / Authorization
    - Build Simple REST API Service with Authentication and Authorization
- **Week 4**
    - Java Design Patterns
        - Creational
        - Structural
        - Behavioral
    - Implemented all design patterns in Java

March 2022

- **Week 1**
    - Java Microservices
        - API Gateway
        - Distributed Tracing
        - Fault Tolerant
            - Circuit Breaker
        - Service Discovery
    - Implemented Fault Tolerance and service discovery in my REST API
- **Week 2**
    - Started working on POC Project
    - Explored GitHub / GitLab
    - SQL Basics
    - Microservices Design Patterns

- **Week 3**
    - Microservices Configurations
        - Spring Cloud Config Server
    - Basics of Docker and Kubernetes
- **Week 4**
    - Ran the POC Project in Docker-Hub
    - Created a MySQL Image in docker for POC Project
    - Connected POC Project to Docker SQL Image

April 2022

- **Week 1**
    - Continued working on my POC Project
- **Week 2**
    - Logging in Spring Boot
    - CICD Pipeline with GitLab
- **Week 3**
    - Deployment of POC Project on Docker Hub
    - Demo of POC Project
- **Week 4**
    - Made Changes to POC Project
        - Implemented API Gateway
    - Explored Hikari Connection Pool
    - Explored various Database Migration Techniques

May 2022

- **Week 1**
    - Revised My Java Concepts
    - Implemented CQRS and SAGA Design Patterns
- **Week 2**
    - Explored Spring Boot AOP
- **Week 3**

- Explored Spring Data JPA in-depth
    - Persistence
    - Entity Manager Factory
    - Entity Manager
    - Entity
    - Entity Transaction
    - Query
    - Entity Relationships

- **Week 4**
    - Introduced to Halo Tractor Team
    - On-Boarding into Halo Tractor tech team
    - Introduced to Halo Tractor Project
    - Started with Django Beginners course
    - Started building Django API

Experience

My Internship at ZapCom has been a wonderful and growing experience. Facing newer challenges every day is a norm here at ZapCom.

I was fortunate to receive training as part of my internship. As I reflect on all we have learned, I realize what this has been an excellent experience. We gathered much knowledge in the classroom, but a hands-on approach has been invaluable. It has served as a beneficial ending to my formal education. Skills such as multitasking, communicating, learning to deal with diversity, and dealing with deadlines are different when you are working for someone else. It is amazing to see how people from different regions stay as one family and work together.

We had so much to learn about the company itself, as to what kind of projects it deals with, who are the clients, what are the company traditions, etc.

Overall, I'm glad to be a part of ZapCom and looking forward to facing new challenges with the knowledge that I have acquired here.

References

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