INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY
SHAHJALAL UNIVERSITY OF SCIENCE AND TECHNOLOGY, SYLHET

Course Code: SWE-420

INTERNSHIP REPORT

Submitted To

Department of Software Engineering
Institute of Information and Communication Technology
Shahjalal University of Science and Technology, Sylhet

Submitted By

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Registration No. 2018831060
Session: 2018-2019

Performed At

Vivasoft Limited
Floor #11, 16 & 19 Ahmed Tower, 28, 30, 1213 Kemal Ataturk Ave.,
Dhaka 1213
Internship Period: 02/02/2023 – 31/07/2023
Date of Submission: 10/08/2023

LETTER OF TRANSMITTAL

7th August 2023
The Director
Institute of Information and Communication Technology
Shahjalal University of Science and Technology

Dear Sir,
I am delighted to submit the internship report as part of the internship program (SWE420) of the seventh semester. I am thankful to the *Institute of Information and Communication Technology* for providing me with such an opportunity to gather practical experience from the industry.

This report summarizes the technical and non-technical abilities I acquired during my internship program at Vivasoft Limited. It also reflects my professional development, project participation, and other improvements and issues during this time. I'm eager to hear your insightful comments on my whole report.

Sincerely yours,
Kawsar Ahemmed Bappy
Reg No: 2018831060
Department of Software Engineering
IICT, SUST

LETTER OF ENDORSEMENT

To Whom It May Concern

Subject: Approval of the Report

This letter serves as a declaration that all the details contained in the report, entitled "Internship Report," are accurate and not confidential information of the company. **Kawsar Ahemmed Bappy** has successfully worked on the projects mentioned below. I also attest that the facts presented here are accurate and not exaggerated.

I, therefore, gladly state the validity of the report and wish Kawsar Ahemmed Bappy all the best in his career.

Shafiul Hasan Md. Tareq Co-Founder Vivasoft Ltd.	Debotush Dam Software Engineer L-II Vivasoft Ltd.	Liton Chandra Shil Software Engineer L-I Vivasoft Ltd.

ACKNOWLEDGEMENT

I want to start by thanking the IICT faculty and staff for arranging this internship program for me. I also want to express my gratitude to Vivasoft Limited for hiring me as an intern and assisting me in completing this program as swiftly as possible.

I would like to use this opportunity to show my sincere gratitude to **Prof. M. Jahirul Islam**, Director of IICT, SUST, and **the faculties** of IICT, SUST, for organizing the industry professionals and for giving me the chance to participate in an internship with such a renowned company.

I am extremely grateful to **Shafiul Hasan Tareq**, Co-founder of Vivasoft Ltd. for his constant support and guidance.

I would also like to take this opportunity to express my gratitude and admiration to **Debotush Dam** (Software Engineer L-II), who leads our team at Vivasoft Ltd., for his excellent leadership, vigilant oversight, and constant support throughout the project engagement portion of my internship.

I also like to thank **Liton Chandra Shil** (Software Engineer L-I), who was my mentor during the initial part of my internship and provided me with teaching, direction, and excellent supervision.

I am also thankful to **Mahdi Hasan** (Software Engineer L-I) and **Md. Mehedi Hasan Rumi (**Software Engineer L-I) for their motivation and guidance throughout the internship period.

Furthermore, I would like to express my appreciation for the warm welcome I received from everyone at Vivasoft Ltd. and for always being willing to listen to my concerns. I especially want to thank my team members and those in the technology and human resources departments for their invaluable advice and assistance. I am appreciative of their cooperation during my internship.

EXECUTIVE SUMMARY

This document illustrates the author's internship experiences and contributions to Vivasoft Limited. It also symbolizes the accomplishments and difficulties encountered during the internship program, both academic and extracurricular. This document's purpose is to identify and summarize the analysis performed, the projects finished, the experience obtained, and the accomplishments as an intern.

The Institute of Information and Communication Technology (IICT) of Shahjalal University of Science and Technology (SUST) offers a bachelor's degree in Software Engineering. According to the curriculum, an entire semester (7th) has been dedicated to the internship program, which carries a total of 18 credits. The goal of this program is to provide an opportunity for its students to experience and gain practical knowledge of the software industry.

As a student in IICT's bachelor's program, I was given the opportunity to complete an internship at Vivasoft Limited, a prosperous local start-up that offers a variety of logistics services and technical solutions for many real-life issues in our community to make people's lives easier than ever. The Vivasoft family welcomed me with open arms as an intern and placed me on a team. I've finished the initial learning phase and assignments, and I've begun to familiarize myself with their projects and working methods. I have gained knowledge of the team's software development methods while working on these projects. The difficulties I faced while working on these projects taught me how to collaborate with my teammates and other professionals. I feel really fortunate to have support and mentoring from all of my teammates and team leaders.

I have discovered a variety of software engineering techniques during the past six semesters. I discovered a workable use of such agile development methodologies as scrum, sprint, etc. Making the connection between my theoretical understanding and the actual implementations is quite helpful to me.

Working on real-world projects gave me the opportunity to apply software engineering best practices as well as improve my problem-solving abilities. This internship program gave me the chance to become a skilled software engineer while also enhancing my abilities and confidence.

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Chapter 1: INTRODUCTION

An internship is a chance that an organization provides to qualified applicants to work at the organization for a predetermined period of time. It may be compensated or not. Interns are typically either recent graduates or college students. When offered during a university semester, internships are often part-time, but when offered over the summer, they are typically full-time.

Interns receive training at a company to enable them in their future professions to become employable members of the industry. Industry and academia can better understand their disparities thanks to these interns. The students get the chance to gain some professional experience before entering the field.

The Institute of Information and Communication Technology (IICT) at SUST provides the opportunity for their students to experience a 6-month internship program as a part of their academic curriculum in the 7th semester. In order to keep up with the most recent technology, IICT consistently emphasizes both academic technology and professional practices. The internship program greatly enhances the value of individual skills and experiences.

1.1 General Outline of Internship

There is no set schedule for the internship. From one organization to another, it differs. However, it can be broadly classified into two sorts, including:

1. Part-Time
2. Full-time

A part-time internship is often based on hours and is appropriate for students who are also enrolled in a university term. In a full-time internship, interns are almost similar to full-time employees as they also spend the full working hour in the office. For students taking a break or participating in an internship semester, a full-time internship is preferable. In comparison to a part-time internship, it offers greater practical experience. My internship had been a full-time position.

1.2 Objectives

The internship program also has certain clearly stated objectives. Following are some significant points regarding the internship's goals:

1. Getting familiar with the corporate culture
2. Overcoming the gap between business and academia
3. Getting an idea about current and future industry requirements
4. Gain professional attitude, growth, maturity, and judgment.
5. Hands-on experience

1.3 Literature Review

The report primarily draws from my experience as an intern at **Vivasoft Ltd.** The corporate structure, culture, and management style have all been defined in detail in order to adhere to conventional literature. The projects I worked on are then discussed, along with the experiences and skills I developed while working on them. The specifics of my work in this area are covered in this section. Last but not least, I provided my own perspective on the entire internship term.

Please note that I have only discussed what I am permitted to share from the organization with the outside world.

1.4 Sources of Information

This report contains much technical and theoretical information. All the information presented here is authentic. The authenticity is based on a review of Vivasoft Limited. The external information is based on the related website links. Information related to the company was verified by the required personnel before submission in order to check for flaws regarding accuracy and confidentiality. The external information Included in this report includes a link to the reference section for proof of its authenticity. Also, the last access time is provided to alleviate any probable confusion.

1.5 Scopes

The term "scopes" refers to an object's region of interest and perimeter. The following are the main criteria that helped define my focus:

1. Company overview and culture without violating confidentiality
2. The training I have received
3. Growth of my technical experiences
4. Real-life project involvement and using the acquired knowledge in personal projects.

1.6 Limitations

There are also some limitations that have an impact on this report. They are briefly described below:

1. Due to the internship period being 6 months, we could not be assigned to long-term or heavy projects. Time constraints restrict us to projects that have lesser requirements.
2. The report is based on my experience at Vivasoft from the 2nd of February 2023 to July 31st, 2023.
3. All the details of the organization and work could not be provided due to confidentiality.

An internship is a source of experience for newcomers to the industry. With its proper utilization, the students can make a good impression on their starting careers. Also, it has great scope for personal skill development.

Chapter 2: COMPANY PROFILE

The customs and culture of Vivasoft Ltd. are covered in this section. The overview of Vivasoft, what it does, its workflow, facilities for employment, training, and recreation, its operations, clients, and partners, management profile, and recruitment procedure have all been covered in the following subsections:

2.1 Company Overview

Vivasoft Limited is a Bangladeshi Software development company. Vivasoft is mainly an outsourcing company, but now they are more focused on bringing their own product to market. Vivasoft built PIHR. **PiHR** is the best SaaS-based HR and payroll management software in Bangladesh. Currently, It has 250+ clients.
It's headquarters are located at Kamal Ataturk Avenue, Banani, Dhaka. On September, 2022, they celebrated their sixth anniversary.

2.1.1 Story

The company's two founders used to work as front-line software experts. Founded in 2016, Vivasoft provides IT consulting and software development services. With the help of a passionate team and talented individuals dedicated to positively impacting the world, Vivasoft's products help businesses grow and succeed. Their goal is to create digital experiences that will make people's lives simpler and more enjoyable.

With about 200 colleagues at their disposal, their focus is on providing innovative software development solutions that make life easier for people worldwide.

2.1.2 Future Plan

As a leading software development company, Vivasoft is committed to delivering exceptional software solutions that meet the unique needs of our clients. Their goal is to provide a world-class software solution for their clients.

2.1.3 Mission

To Vivasoft, there is no differentiation between customers, coworkers, and the people who run the business. We develop innovative software to help businesses operate more efficiently while maintaining the best possible relationships with their customers and coworkers.

Their services are used by some of the country's largest organizations. They have a team of experienced professionals who are passionate about their work and aim to provide our clients with the best possible service.

2.1.4 Vision

Vivasoft’s mission is to inspire, engage, and promote a friendly working environment to establish itself as the leading software development company worldwide.
Their main goal is to make the company a prime choice for high-tech support and other technical needs. Vivasoft is a software company that provides all sorts of technical services, from simple bug fixes to complex business solutions.

2.2 What Vivasoft Does

As I mentioned earlier, Vivasoft is a software development company. They help bring the ideas of their clients to reality. They support the whole software development life cycle. They manage client projects, consult, architect, design, develop, and test. As Vivasoft maintains continuous integration and continuous development/delivery after some sort of development, clients can view what they are developing and give their feedback.
The services provided by Vivasoft are:

- Software Development
- Software Quality Assurance
- ML/AI
- MVP As a Service
- Biz intelligence
- Mobile App Development

2.3 Services

Based on its customer roles, Vivasoft provides many internal and external services for its partners and target customers. The main services mentioned here You might visit their website to learn more.

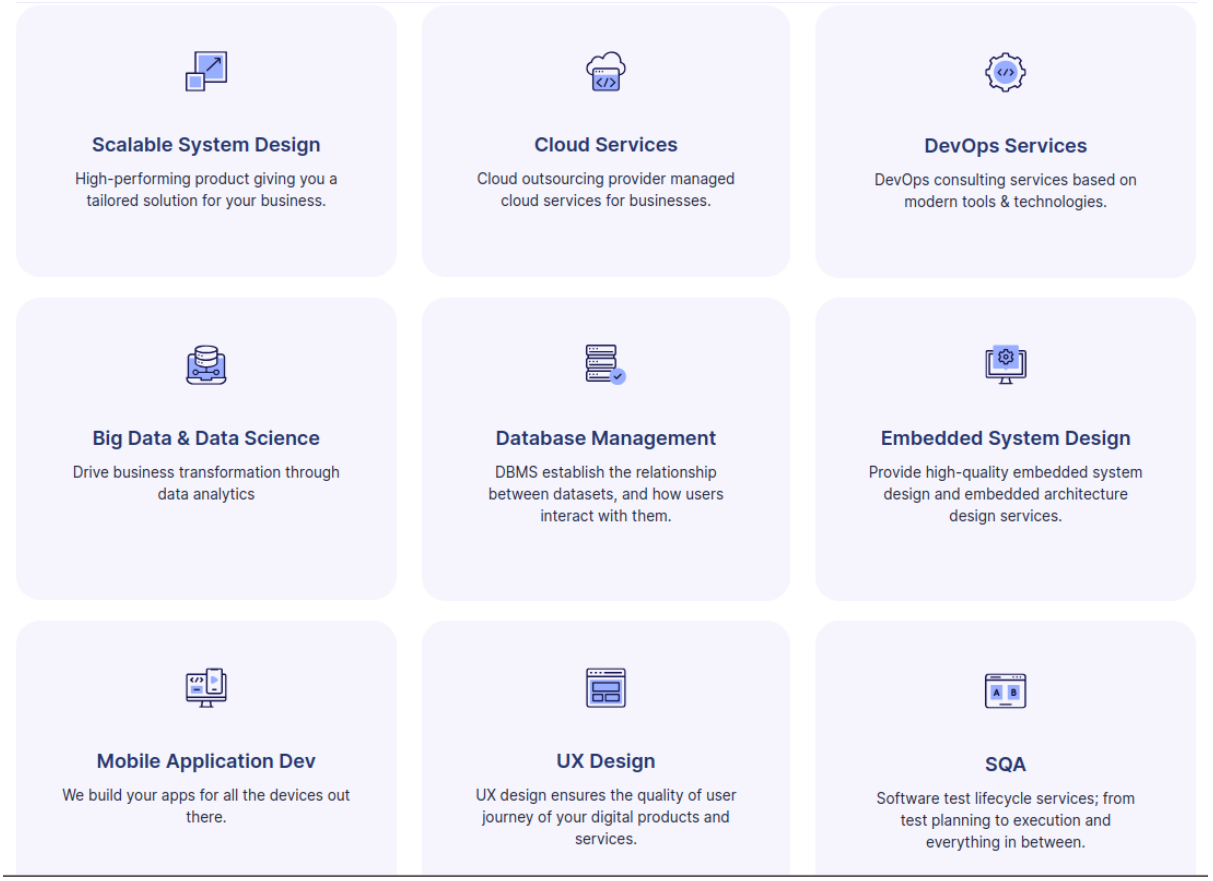

Figure 1: Services of Vivasoft

2.4 Departments in Vivasoft:

Vivasoft has a very large workforce to complete their day-to-day goals and provide its users of all kinds, a good experience. The daily operations of Vivasoft take place by following strategic methodologies combined with the participation of different departments, as follows:

- Technology
- Operations & Support
- Marketing
- Sales
- Accounting

As I have been recruited as an intern under the technology department, in the next sub-section I'll try to give an overview of the technology department at Vivasoft.

2.4.1 Technology Department:

Vivasoft's Technology Department consists of the very best and brightest tech minds in the country. The amazing skill set and vision of each individual here keep Vivasoft moving toward its goal.
This department is divided into a few individual teams, which are here called clans. These are,

- Javascript Clan
- GoLang Clan
- Java Clan
- C# Clan
- Python Clan
- Mobile Clan
- DevOps Clan

The Design Team and SQA Team are under the Management Clan. Every clan has a clan leader. The friendly yet professional environment of the workplace ensures that every team works collectively to fulfill the requirements and prepare the perfect software solutions for each project and product. Though each team has different types of work and methodologies, their work is interrelated with one another.

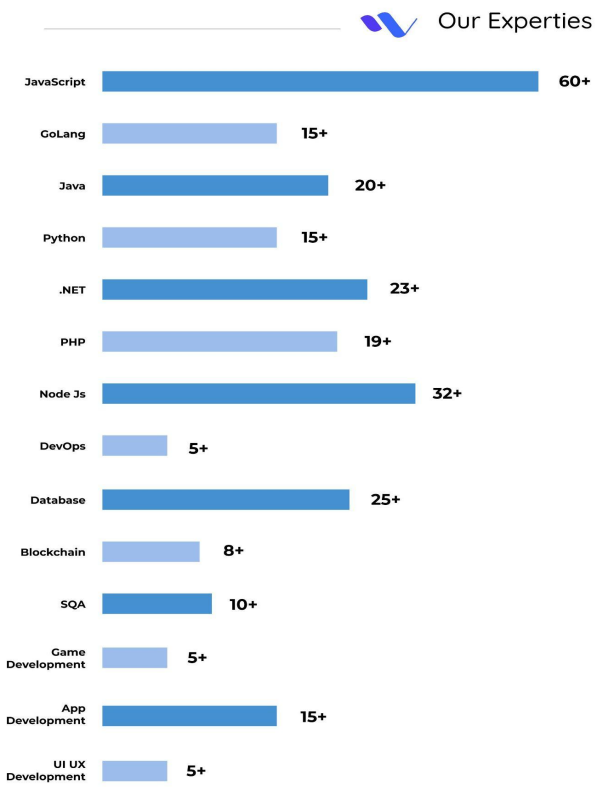

Figure 2: Number of Engineers

2.5 Products of Vivasoft

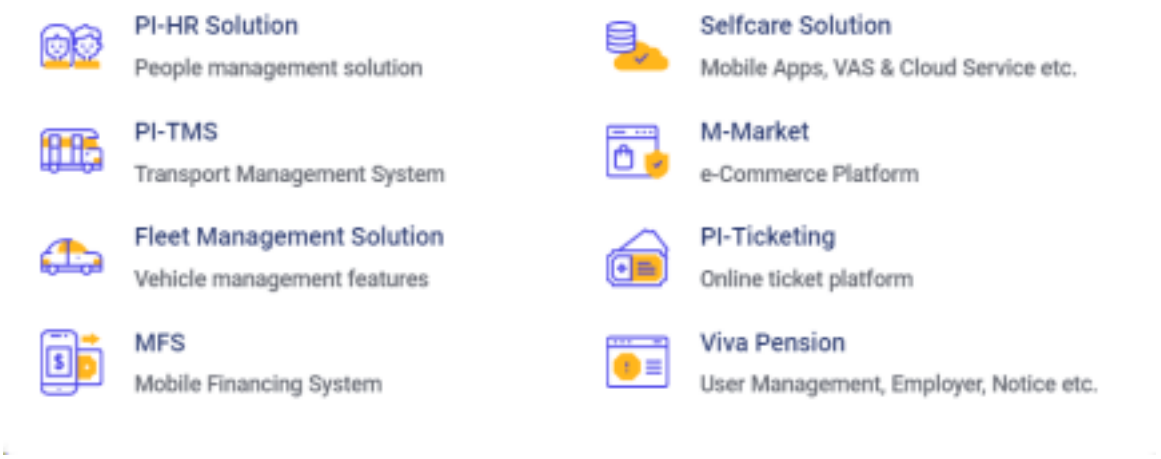

Figure 3: Products of Vivasoft

2.6 Major Projects of Vivasoft

Major Projects

MyCash

Mobile Financial Services (Somalia)

200K	2M $	Amtel
Registered Users	Transaction Daily	Somalia

MyCash app is a virtual money based app where the users can deposit and use their money whenever it's needed. This is a whole MFS system that can help people to organize their money and distribute them properly. MyCash offers mobile financial services by combining a banking network with mobile wireless networks. Such networks allow individuals to input money, make deposits, make withdrawals, and send and receive funds using mobile apps or USSD

Key Features

- Send & Receive money
- Remittance send and receive
- Cash in and out
- Bank Transfer
- Merchant payment
- 3 levels of agent hierarchy
- Transaction history
- Email & SMS notification
- Reporting module
- Customer Care functionalities
- Android & iOS app

Technology Used

Java | kafka | Vue.js | Thymeleaf | redis | MySQL

Wellteam

A Software to Boost Mental and Physical Fitness

Key Features

- Assessment tool to evaluate mental and physical fitness
- Fitness program of activities according to assessment
- Solo/Team fitness program management
- A Streamlined Member and Customer Dashboard
- Automated Billing and Payment
- Automatic Email Alerts and Notifications on Events
- Online/Offline Fitness Event Management
- Fitness Activity Progress Tracking
- Reliable Fitness Management Reporting and Analytics
- Leaderboard to Track Fitness Activity of Members

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ctS database powered by CenExel

Duplicate Clinical Trial Subject Detection Platform

Key Features

- Advanced search facility
- Token based security
- Role/Policy based Authentication and Authorization
- Maker-Checker Functionality
- Automatic Email Alert and Notification on Events
- Advanced Logging and Live Metrics
- User Activity Auditing
- 50+ insight-driven, explorative, and analytical reports

PiHR

HR and Payroll Management Software (Bangladesh, Malaysia, Sudan, UAE, United Kingdom)

300+ Companies in Bangladesh uses PiHR

PiHR is a SaaS based fully integrated HR and payroll software management system. With PiHR the organizations can streamline their HR and payroll processes. It helps the management to reduce manual work, plan strategically and think out of the box to improve their business growth.

Key Features

- Employee Attendance Management
- Employee Live Location Tracking
- Payroll Management
- Leave Management
- TAX Management
- Shift Management
- Provident Fund Management
- Gratuity Management
- Break time reconciliation

Notable Clients

Technology Used

Flarie

Advergaming platform (Netherland, Denmark, Sweden - Global)

Flarie is one of the leading entertainment companies for brands with a scalable platform for gaming to entertain and engage their audience dynamically on any device or touchpoint. Individuals can play games within the ads and earn incentives. Gaming authorities can customize existing game templates as per their requirements.

Key Features

- Custom game background and element
- Purchase real products from collaborative brands
- In built analyzing tool
- Advertisement performance analysis
- Awareness, likeability & consideration
- App, web & api integrations
- Product & Consumer Insights
- Lead generation with integrated funnel

Technology Used

Major Clients

Number Skills

Power BI Solution Provider

Numberskills is a Swedish company that provides power BI solutions all over Europe. It solves data related reporting issues for companies. Numberskills is proudly handling millions of data per month.

Key Features

- 3rd party API integration
- Data warehousing
- Data processing with data factory
- SQL Server
- Application with processed data for end user
- Budget forecasting
- Reporting

Technology Used

ASP.NET | Vue.js | Azure

Application

On premise web based Application

Major Clients

advania | Coromatic | Marbit Anläggning & Utemiljö | Netigate

Klikit

Food Order Aggregator (Singapore, Philippines, Malaysia, Australia - Global)

Maintaining a food brand on multiple food delivery platforms isn't easy. With klikit, the restaurants can manage multiple food delivery companies from one single platform. It increases efficiency and cuts down time significantly.

1 Platform — Multiple Restaurants
- Order Management
- Menu Management
- Performance Analytics
- Virtual Brand

Generally the restaurants update their menus, prices, and offers manually in the delivery platform's portals one by one. But in klikit they only have to update the necessary changes once and the information will be updated in all the platforms automatically as klikit is integrated with these platforms.

Integrated Platforms

GrabFood foodpanda gofood Powered by gojek

Bryan Pineda
Operations Manager,
Kraver's Canteen

"I'm very happy with klikit Analytics, especially the sales per category metric, since it really minimizes our work"

Technology Used

	Golang	elasticsearch	MySQL	Flutter
kubernetes	Google Cloud Platform	Kong	redis	

Toja Connected Water

Creating Awareness of Water Usage Among People

Toja Connected Water promotes awareness of water usage. It is promoted by a German company. An IoT device is connected to the water line. This device triggers alerts about water usage every three minutes. When a user uses more water, he has to pay more compensation. To have a positive connection with water, users have to compensate for a minimum of 120 percent of their actions.

Key Features

- Certificate generation for valuable customers
- Water usage tracking
- Custom dashboard
- Historical data analysis
- Both online and offline payment facilities
- Reports generation

GPS Ping

Live Location Tracking Service

GPS Ping is a live location service that holds requests coming from various points. Through this service, GPS Ping has the potential to process 10,000 requests per second. It can save historic GPS tracking data for 30 days. The ping drop or ping loss message can be displayed only if the tracking object stops somewhere.

Key Features

- Live Location Tracking
- Data Analysis
- Reporting

2.7 Major Clients and Partners

2.8 Tools And Technologies

Vivasoft Is not Specialized or stuck within a specific technology. It works with different Technologies and Frameworks.

C#/.NET	Asp .NET MVC, Web Api, Entity Framework, SharePoint, and WPF
JAVA	Spring, Hibernate, JSP, etc
GoLang	Gin, Echo, and Grom
Python	Django, FastAPI, Flask, etc
Javascript Universe:	React js, Aurelia JS, Vue JS, Ember JS, jQuery, jQury UI, Node.js, and AngularJS
Databases:	MS SQL Server, MySQL, MongoDB, Oracle, Redis,PostgreSQL, Amazon Dynamodb, Time series Db, etc
Mobile	Flutter, Android, Swift, Objective c etc.
WEB3	Block-chain,NFT, Distributed finance, etc

Devops, Cloud	Kubernetes, Docker, Jenkins, Azure, Aws, Helm, etc
Others Languages	Rust, PHP & Lua, etc

2.9 Office Environment

According to the two factor theory of job satisfaction, salary is just a hygiene factor. Motivational factors are important for high productivity. Vivasoft offers its employees several facilities.

2.9.1 Domestic Environment

Vivasoft offers a fantastic workspace with all the essential amenities. Everyone at Vivasoft strives to do their best job in a collaborative environment. In addition to increasing employee productivity and assisting in the delivery of a better product to the client, the shared objective of resolving various issues and obstacles each day also helps employees develop their own talents.
Additionally, the Vivasoft team is continually focused on cutting edge technology and has the flexibility to adapt better processes in order to keep a strong hold on the market and continue growth. Because of this, Vivasoft served as a good learning environment.

2.9.2 Communications and Meetings

The two main communication platforms used by Vivasoft are Mattermost and Skype. The administration set up a company email account for each employee when they were hired. Anyone in the company can be reached at any time thanks to this channel of communication. Google Meet is also mostly used for meetings and one-on-one interactions.

2.9.3 Daily Stand-ups

In contrast, each team holds a daily stand-up meeting at the start of the day, during which each team member provides an update on the duties he has performed and his plans for the next. This enables all team members to be informed about the group's daily status and development.

2.9.4 Office Schedule

According to business regulations, employees are required to work 45 hours each week. On Monday through Friday, office hours are from 10:00 a.m. to 7:00 p.m. There is a lunch break and various breaks for activities. However, the company offers its staff flexible working hours.

2.9.5 Dress Code

At Vivasoft, there is no set dress code. The majority of the staff wears semi-formal or casual attire. However, nobody is permitted to enter the office while dressed improperly. It is also OK to wear clothing with logos from rival software companies or other businesses in the office.

2.9.6 Fine System (Star Board)

If official rules are broken, Vivasoft has a strict fine mechanism. Every fine is logged on a digital board and counted. The Star (*) designates the fine unit. Small parties or activities can be funded by the penalties that are collected.
A fun fact is that if somebody does a good job, a star will also be taken off.

2.9.7 Admin support and Technical Support

The administrative support team manages the administration of the food, training sessions and seminars, official complaints, logistical support, etc. Administrative support merely needs to be informed of an employee's needs, and they will take care of it.
The technical support team is always on hand to help with hardware and network-related problems. Additionally, they will take care of the software licensing issues and provide engineers with the assistance they require.

2.10 Employment Facilities

2.10.1 Mentoring

Each new junior employee at Vivasoft receives a mentor. They will continue their mentor's instruction for nearly two months. To prepare for working on actual projects later, they develop small assignments now. In this circumstance, the mentors' counsel is quite significant.

2.10.2 Vivasoft Learning Sessions & Bootcamps

Regular learning sessions are scheduled by Vivasoft.One soundproof room has been set up in the Banani Office for the purpose of recording audio and video lessons, podcasts, etc.
Additionally, Vivasoft organizes bootcamps for learners.

Figure 4: Vivasoft Bootcamps

Those are:

- JavaScript Bootcamp
- TypeScript Bootcamp
- Python Bootcamp
- Git Bootcamp
- Golang Bootcamp

2.10.3 Lunch & Snacks

The employees are provided lunch and evening snacks from the office. Also, tea, coffee, and biscuits are available all the time.

Figure 5: Iftar at Vivasoft

2.10.4 Sports

Vivasoft are just crazy about sports, like Cricket, badminton, table tennis, ludo, etc. Every year, Vivasoft arranges intersports tournaments of badminton, table tennis, ludo, and caroms. Vivasoft features an exceptional game room to bring out the inner sportsman in employees!

Figure 6: Sports Occasions

Figure 7: 29 Card tournament

2.10.5 All Facilities in a Nutshell

Anyone May also Check the list on the website of Vivasoft Limited Careers.

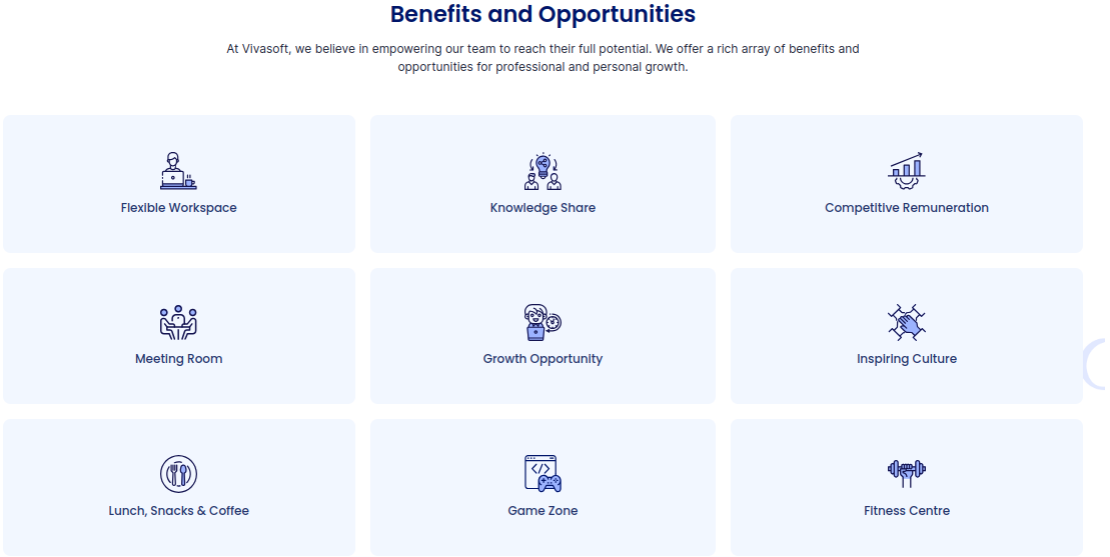

Figure 8: Employee Facilities in a Picture

2.11: Recruitment and Selection

Vivasoft recruits from the following sites:

1. Vivasoft Website (https://www.vivasoftltd.com/career/)
2. Facebook Page (https://www.facebook.com/vivasoftltd)
3. LinkedIn Page (https://www.linkedin.com/company/vivasoftltd/)
4. References from existing employees and networks
5. For any query: mailto:contact@vivasoftltd.com

2.12 Culture

2.12.1 Cooperation

Every employee is helpful and cooperative. It is not required that team members exclusively assist one another. Any employee can ask for assistance from a senior member or an expert from another team if they are stuck at any point. The assistance extends beyond project work to include blood donation and other services.

2.12.2 Friendly Environment

I was an intern for almost six months. None of the members could tell us apart from the other workers. They were incredibly cordial. They aid in our ability to adjust to challenges and new changes. Additionally, the welcoming atmosphere allows us to mentally recharge after long periods of labor.

Figure 9: Refreshing moments

2.12.3 Inspiration

The atmosphere at Vivasoft is very motivating. After doing each tiny assignment, my team's leader in particular gave me inspiration. This motivation encourages me to concentrate more on my task. The entire team is also motivated by upper management following successful client demos.

2.12.4 Flexibility

Employees at Vivasoft have flexibility. Flexible working hours are offered. Anyone can have flexibility for their critical tasks. With this, the teams are really helpful.

2.12.5 Gifts

The most common gifts are:

- Rokomari.com Coupon: For writing blogs, submitting reviews about projects, etc.

- Eidee during Eid
- Goodbye Gifts
- Summer Gifts

Figure 10: Gifts to a New father

Figure 11: Summer Gifts

Figure 12: Eid Gifts

Figure 13: Goodbye Gifts

2.14 Miscellaneous

Vivasoft provides a monthly allowance for each Clan to organize a team lunch/dinner. This helps team members get to know each other and create a good bond among them.

Besides, Vivasoft celebrates every occasional day in a colorful way. It celebrates the New Year by offering wonderful gifts to the employee. Pahela Falgun, International Women's Day, was also celebrated with great enthusiasm. Vivasoft plans to offer internships every year. We were warmly welcomed with lovely gifts by the Vivasoft family. It should be mentioned that Vivasoft provided us with accommodation options inside the office. This was really beneficial for us.

Figure 14: Different festival Occasions

Figure 15: Symphony of celebrations

Chapter 3: Software Methodologies & Cultures

This chapter briefly emphasizes the software development methodologies that are generally followed in software development processes in Vivasoft.

3.1 Development Process Management

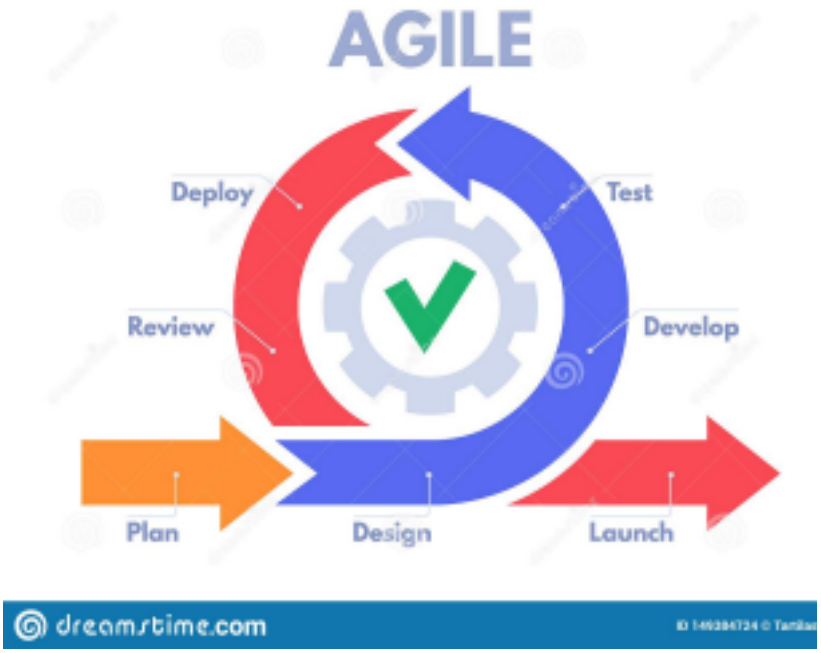

Figure 16: Agile Methodology

The Agile software development process is used by Vivasoft. Agile software development approaches are those where requirements and solutions are developed through cooperation among self-organizing cross-functional teams and are founded on the idea of iterative development. Agile development's greatest benefit is that it empowers teams to produce results more quickly, with higher quality and predictability, and with a greater capacity to adapt to change. It is the best procedure here because Vivasoft has numerous teams that collaborate. The two most popular Agile frameworks in Vivasoft are Scrum and Kanban.

Agile has a subset called Scrum. It is a simple foundation for an agile development process. Scrum is most frequently used to oversee the iterative and incremental development of complex software and products.
Agile software development is commonly implemented using the Kanban methodology. It necessitates complete transparency in work and real-time capacity communication. Team members can always observe the status of every piece of work thanks to the visual representation of work items on a kanban board.
Sprint is another term I'd like to use. A sprint is a discrete, once-through iteration of an ongoing development cycle. The team must finish the anticipated amount of work during a Sprint and prepare it for review. After the planning session, the team immediately begins the sprint, working together to effectively finish the intended work and have it ready for review at the end of that time.

3.2 Steps of the Development Process

I acquired knowledge and carefully observed the process of creating and releasing new application features. The entire development cycle can be broken down into its component parts:

3.2.1 Gathering Requirement Specification

This stage of the development workflow is the first one. The specifications for the features that need to be implemented are acquired at this phase. To examine the requirements, collaborative meetings are scheduled with the development, design, and quality assurance teams. Once the needs have undergone a thorough examination, a Software Requirement Specification (SRS) document and User Story are created, and the requirements are then locked and ready for implementation.

3.2.2 Design

The design team begins creating the UI/UX design of the features as soon as the requirements are established. Other teams are then given access to the designs, and they provide input. The design is finished after a few iterations. The designs have been incorporated with the other documents, and the programmers may now start implementing them.

3.2.3 Development Cycle

From the standpoint of the developer, back-end and front-end development are carried out simultaneously during the sprint.

Back-end Development:
As soon as Sprint starts, back-end development begins. Based on the needs of the project, the web team constructs the project API or builds an API gateway by obtaining data for other services.

Front-end Development:
The interface is implemented by front-end developers in accordance with the production team's approved design. Developers must keep a better user experience in mind throughout this process.

Everyday Stand-Ups:
During the sprint cycle, daily stand-up meetings are held, where developers state,

- What progress has been made since yesterday?
- What is the plan for today?
- What are the obstacles each one is facing?

3.2.4 Testing

The scrum master or product owner declares EOD (End of day) at the conclusion of the sprint. where development teams show off the objectives they have met over the sprint. The code section is frozen, and the SQA team begins testing the newly developed feature. The bugs and problems have been reported.

3.2.5 Bug Fix and Staging

As soon as the SQA team discovers a bug, bug-fixing begins. After all, the bugs have been fixed, and the program is shown on stage for closer inspection. The program is tested on stage using use cases taken from real-world situations. The development teams address any issues that are discovered at this point.

3.2.6 Production Deployment

The product owner decides whether to release the application after multiple sprints when it is in a stable state. The program is released for production by the DevOps team.

3.2.7 User Acceptance Testing

A user acceptability test is carried out at Vivasoft before any application is made available to the general public. This process, known as UAT release, involves all Vivasoft workers using the program as beta testers. This method not only identifies the technical problems but also the operational and marketing facts and loopholes that need to be closed.

3.2.8 Final Release

After UAT, all bugs that were reported are resolved, and the application is then ready for its final release. The application is still in development due to industry demands, ongoing technological advancements, and the sporadic emergence of numerous edge cases. After that, another scrum procedure is used.

3.3 Development Tools

Vivasoft uses many tools for maintaining and managing its projects. Based on my working experience, some are mentioned below:

3.3.1 Version Control Systems (VCS):

VCS helps teams manage changes to source code over time and facilitates collaboration among developers. Although Git is the most widely used VCS, platforms like Gitea, GitLab, and Bitbucket are also popular choices for hosting Git repositories. Vivasoft uses Bitbucket and Gitea to host their private repositories.

3.3.2 Design tools:

Figma is a vector graphics editor and prototyping tool that is primarily web-based, with additional offline features enabled by desktop applications for macOS and Windows. The Figma mobile app for Android and iOS allows viewing and interacting with Figma prototypes in real-time on mobile devices.
Vivasoft uses Figma for hosting interface designs. The design team, product team, and front-end developers collaboratively use this application.

3.3.3 Project Management Tools:

Jira is a proprietary issue tracking product developed by Atlassian that allows bug tracking and agile project management. Vivasoft uses Jira boards to break down the tasks, assign them to the developers, and maintain the sprint. Other important features of Jira software are Scrum boards, Kanban boards, GitHub integration, Disaster recovery, Code Integration, Portfolio Management, Sprint Planning, Project management, etc.

3.3.4 Code Review Tools:

The peer review process, in which engineers evaluate each other's code for quality and correctness, is made easier by code review tools. Most of it is accomplished through GitHub pull requests.

3.3.5 CI/CD Tools:

CI/CD tools automate the process of integrating code changes, running tests, and deploying software to production or staging environments. This automation ensures that code is continuously integrated and tested, reducing manual errors and speeding up the deployment process.
Vivasoft uses Jenkins mainly as their CI/CD tool.

3.3.6 Cloud Computing Platforms

Vivasoft primarily uses AWS (Amazon Web Services) for cloud computing solutions; however, they occasionally also use Microsoft Azure.
AWS is a comprehensive cloud computing platform provided by Amazon.com. It offers a wide range of cloud services, including computing power, storage options, databases, machine learning, analytics, networking, and more.
AWS provides Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) offerings, allowing businesses and developers to build, deploy, and manage applications and services in the cloud.
Some popular AWS services include Amazon EC2 (Elastic Compute Cloud) for scalable virtual servers, Amazon S3 (Simple Storage Service) for object storage, Amazon RDS (Relational Database Service) for managed databases, and Amazon Lambda for serverless computing.

3.3.7 Containerization and Orchestration Tools:

Vivasoft uses Docker, Kubernetes, and Docker Swarm as their Containerization and Orchestration Tools. Kubernetes is an open-source container orchestration system for automating software deployment, scaling, and management. Google originally designed Kubernetes, but the Cloud Native Computing Foundation now maintains the project.

3.3.8 Collaboration and Communication Tools:

Skype is the preferred method of communication among employees. The management team uses Mail and Mattermost for formal correspondence.

Chapter 4: Internship Activities

4.1 Overview

When theoretical knowledge is put into practice in real life, it sharpens. The primary objective of my internship was to learn from the projects I worked on. These initiatives have given me insightful ideas for real-life scenarios.

I had the chance to participate in some training projects. I took the utmost care when finishing those tasks. While working on these projects, I learned about many new technologies I was unaware of. I had to exert myself and broaden my knowledge as a result. It enabled me to expand my boundaries.

I have learned a lot of technical and non-technical skills during my internship. This internship program enriched me in both technical and non-technical aspects, which I should apply to my professional career.
My internship period can be divided into two phases. Each phase is described below:

4.2 Phase One: Initial Learning Period

During the initial learning period of my internship, I was excited to be assigned under the guidance of a skilled mentor who would help me embark on the journey to become a ***back-end developer***. With great enthusiasm, I dove into the world of ***Golang***, armed with the resources and documentation provided to me.

As I immersed myself in the language, I began to grasp the fundamentals and concepts of Golang, understanding its syntax, data structures, and unique features. My mentor encouraged me to explore various topics, including RESTful API development, database interactions, and asynchronous programming.

I had the opportunity to work on two exciting demo projects that allowed me to apply my newfound knowledge of Golang and backend development. These projects were aimed at solidifying my understanding of building RESTful APIs and honing my skills as a backend developer.

4.2.1 Open-Source Contribution (Golang Bootcamp in Bangla)

During my enriching internship period, I had the wonderful opportunity to contribute to an open-source GoLang Bootcam in Bengali (Bangla). This remarkable project aimed to provide comprehensive learning resources to aspiring developers interested in mastering the Golang programming language.

My involvement in the bootcamp allowed me to take on the responsibility of creating and writing several chapters that covered essential Golang concepts and addressed common challenges faced by learners. These chapters were carefully crafted to facilitate effective learning and understanding among the local audience.

Figure 17: GoLang Bootcamp

Working on the bootcamp was an incredible experience that not only honed my technical skills but also provided me with invaluable insights into the open-source culture. Collaborating with mentors and fellow contributors taught me the significance of teamwork and the satisfaction of giving back to the community.

Through this initiative, I realized the power of documentation and how it can empower others to excel in their journey as developers. Writing in Bengali enabled me to bridge the language barrier and make complex technical concepts accessible to a broader audience.

My contributions to the Golang bootcamp have had a positive impact on the project, and I am proud to have played a role in supporting the growth of aspiring developers. As I continue on my career path, I look forward to further engaging in open-source projects and contributing to the development community.

I would like to express my heartfelt gratitude to the mentors and fellow contributors who guided and inspired me throughout this remarkable

experience. Their support and encouragement have been instrumental in shaping my professional growth.
My involvement in the bootcamp allowed me to take on the responsibility of creating and writing several chapters that covered essential Golang concepts and addressed common challenges faced by learners. These chapters were carefully crafted to facilitate effective learning and understanding among the local audience.

As I delved into the task of creating valuable content, I embarked on an extensive research journey to ensure the accuracy and relevance of the material I produced. During this phase, I explored various resources that proved instrumental in shaping the quality and depth of my writing. The following resources played a significant role in enriching my knowledge and guiding my approach:

1. "*The Go Programming Language*" by Alan A. A. Donovan and Brian W. Kernighan: This comprehensive book served as an authoritative reference for Golang fundamentals and best practices. It provided clear explanations and practical examples that helped me solidify my understanding of key concepts.
2. "*Head First Go*" Book by Jay McGavren
3. "*Go in Action*" by Brian Ketelsen, Erik St. Martin, and William Kennedy
4. Golang Official Documentation: The official documentation by the Golang team served as a reliable source for in-depth insights into language specifications, libraries, and package documentation. It enabled me to write accurate and well-documented content for the bootcamp.
5. Online Tutorials and Articles: Various online tutorials and articles, hosted on platforms such as Medium and Dev.to, contributed to my understanding of real-world Golang applications and programming techniques. These community-contributed resources inspired me with innovative ideas to include in the bootcamp.
6. Open-Source Golang Projects: Exploring open-source Golang projects on GitHub not only exposed me to real-world codebases but also taught me the best practices and patterns adopted by experienced developers.

The collective knowledge gained from these resources, including blogs, influenced the style, accuracy, and depth of my writing, making the bootcamp chapters a valuable resource for learners seeking to master Golang in Bengali.

In conclusion, my involvement in the open-source Golang bootcamp has been a transformative journey. It has reinforced my passion for learning, provided me with valuable technical skills, and instilled in me the value of giving back to the development community. As I move forward, I am excited about the possibilities of contributing more to open-source projects and making a positive impact on the world of software development.

4.2.2 Librario: A Bookstore Backend REST API in Golang

In this project, I was tasked with creating a robust backend for a BookStore application. I began by designing the API endpoints that would handle various operations, such as adding, updating, and retrieving books. I also integrated user authentication and authorization to secure the endpoints. As I progressed, I implemented data validation and error handling to ensure the API's reliability and user friendliness. Additionally, I explored various Golang libraries and best practices to optimize the application's performance and maintainability. This project taught me the significance of creating well-organized code and scalable architecture for complex applications.

Project Structure:

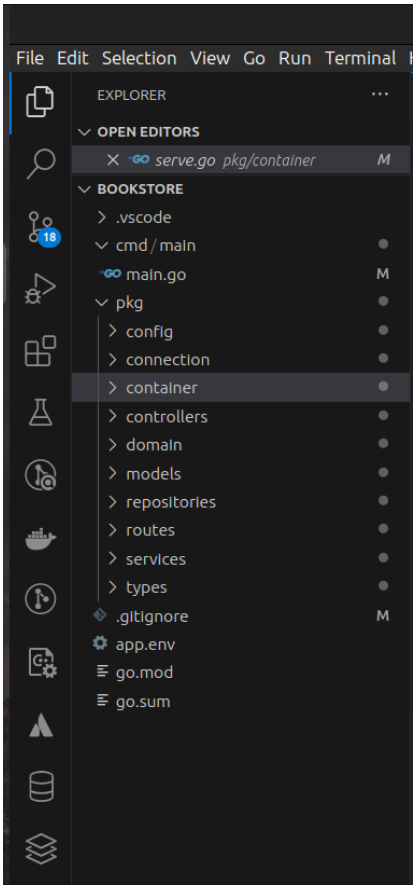

Figure 18: Librario structure (backend)

Clean Architecture (Repository Pattern):

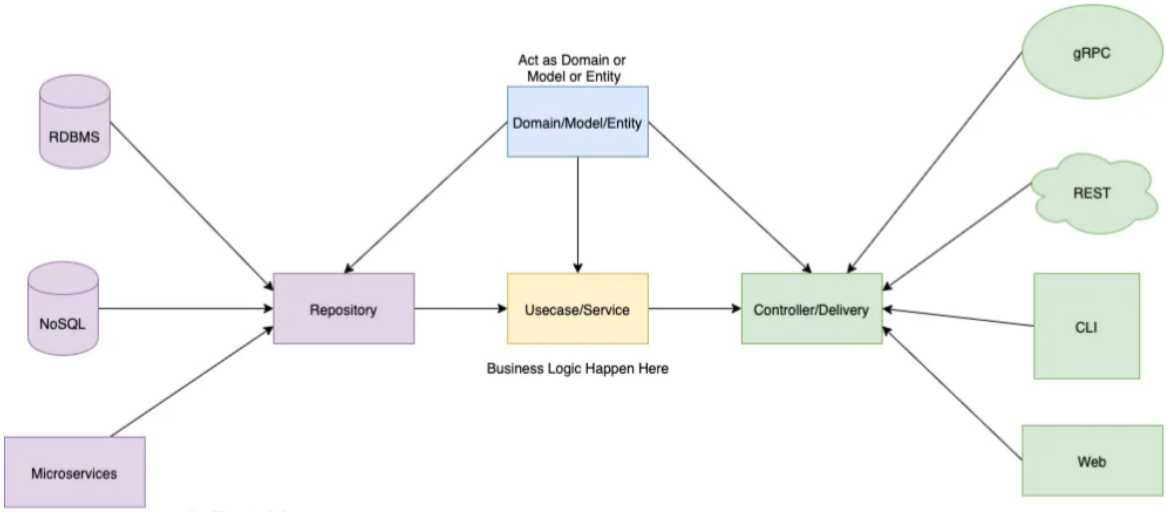

Figure 19: Clean Architecture

Tools and Technologies Used in the Project

- ★ Language: GoLang
- ★ Database: MySQL
- ★ Clean Architecture: Repository Pattern
- ★ HTTP Request Router: Gorilla MUX
- ★ ORM: Gorm
- ★ Validation: Ozzo validation
- ★ Configuration Management: Viper
- ★ API Documentation and Testing: Postman
- ★ Version Control: Git

Skills I Learned in the Project:

- I developed RESTful APIs using Golang to handle CRUD operations for books.
- Followed a Clean Architecture (Repository Pattern)
- Utilized Golang libraries for efficient data validation and error handling.
- Managed configurable variables of the project in a proper way
- Explored best practices for optimizing performance and maintainability.

4.2.3 e-Shopify: E-commerce Backend REST APIs in Echo

During the second project, I undertook the development of an e-commerce platform's backend, which presented an engaging and challenging opportunity. The project involved efficiently handling multiple entities, such as products, orders, and user profiles.

To ensure seamless data management, I skillfully implemented CRUD operations for each entity, maintaining smooth interaction between them. Leveraging Redis for caching significantly enhanced the application's performance, enabling quick access to frequently requested data.

Security was a top priority, and I integrated JWT (JSON Web Tokens) for authentication, offering secure and stateless user authentication across the platform. Additionally, I implemented role-based authorization, ensuring that users were granted appropriate access privileges based on their roles.

Advanced features, including search functionality and pagination, were thoughtfully incorporated to enhance the overall user experience, simplifying product discovery and navigation.

Adhering to RESTful principles, I created a well-organized and modular codebase, ensuring maintainability and extensibility. This architectural approach facilitated the smooth integration of new features as the platform evolved.

Furthermore, I containerized the backend application using Docker, streamlining deployment and scalability. Dockerization provided a consistent and reproducible environment, enabling easy deployment across various platforms and simplifying the onboarding process for developers and teams.

By combining Redis caching, JWT authentication, role-based authorization, and implementing advanced features alongside Dockerizing the backend, I successfully delivered a robust and high-performing e-commerce platform, catering to the demands of modern online businesses.

Project Structure:

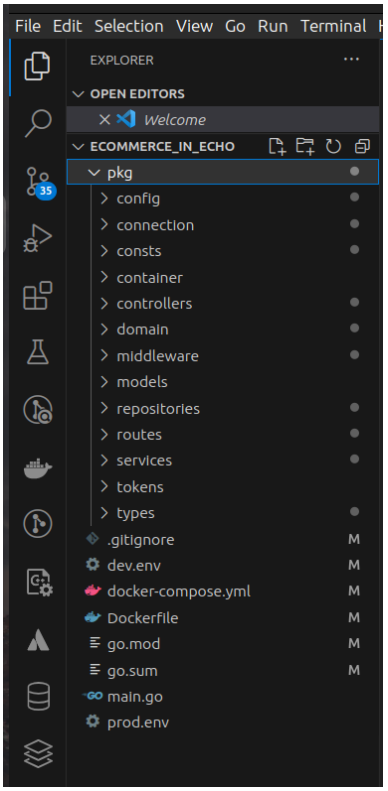

Figure 20: e-shopify structure (backend)

Tools and Technologies Used in the Project:

- ★ Language: GoLang
- ★ Framework: Echo
- ★ Database: MySQL
- ★ Cache: Redis
- ★ ORM: Gorm
- ★ REST API: For setting up the API endpoints
- ★ Clean Architecture: Repository Pattern
- ★ HTTP Request Router: Gorilla MUX
- ★ Validation: Ozzo validation
- ★ Containerization: Docker
- ★ Authentication: JWT (JSON Web Tokens)
- ★ Role-Based Authorization: Custom Implementation
- ★ Configuration Management: Viper
- ★ API Documentation and Testing: Postman
- ★ Version Control: Git

Skills I Learned in the Project:

- Created RESTful APIs in Golang using the Echo framework to manage products and orders.
- Implemented CRUD operations for each entity and optimized database interactions.
- Utilized query parameters for search functionalities and implemented pagination for handling large datasets.
- Followed RESTful principles and adhered to Golang Echo's conventions for creating well-organized routes.
- Implemented user authentication and authorization to secure API endpoints.
- Leveraging *Redis* as a caching mechanism to optimize application performance and achieve lightning-fast data access
- Integrating *JWT* (JSON Web Tokens) for secure and stateless user authentication across the platform
- Implementing role-based authorization to ensure appropriate access privileges based on user roles
- Dockerizing the backend application for seamless deployment and scalability across different platforms
- Gaining proficiency in working with Golang, MySQL, Redis, and various technologies used in backend development.
- Developing problem-solving skills through debugging and resolving technical challenges during the project

4.2.4 Solving Critical Backend Challenges with Graph Algorithms:

I was given a difficult task to do to address an acute issue the Project KlikIt backend team had encountered at the end of the initial learning period of my internship. The problem required a deep understanding of graph-related algorithms, and I took it as an opportunity to showcase my problem-solving skills and technical knowledge.

As I delved into the problem, I applied various graph traversal algorithms, such as Breadth-First Search (BFS) and Depth-First Search (DFS), to devise an efficient solution. By implementing these algorithms, I successfully tackled a part of the problem. I was given an exciting opportunity to work on a different live project. This opportunity not only validated my initial efforts but also provided me with hands-on experience in a real-world scenario.

The experience of solving the graph-related problem and subsequently getting a chance to work on a live project highlighted my eagerness to learn and adapt to new challenges. It exemplified my willingness to take initiative and contributed significantly to my professional growth during the initial learning phase of my internship.

I am unable to discuss the code or the specifics of the issue due to the NDA (non-disclosure agreement).

4.2.5 Exploring Kafka and RabbitMQ: Microservice Communication:

I was given a study assignment to investigate the world of message queues, interservice communication, and its significance in microservice design after having the opportunity to work on a live project. My task involved gaining insights into popular message queue technologies, such as Kafka and RabbitMQ, and understanding how they facilitate seamless communication between microservices.

Figure 21 : Apache kafka

Figure 22: RabbitMQ

Delving into this topic, I thoroughly researched the core concepts and functionalities of message queues, focusing on their role in ensuring reliable and scalable inter-service communication. I further applied my knowledge to create proof-of-concept projects using Golang, where I integrated Kafka and RabbitMQ to demonstrate their practical implementation in microservice architectures.

These projects allowed me to witness firsthand the benefits of message queues for decoupling services, ensuring fault tolerance, and managing message processing asynchronously. Additionally, I gained proficiency in utilizing Golang's strengths to harness the power of message queues effectively.

Skills I Learned:

- ★ In-depth understanding of message queues and their importance in microservice architecture.
- ★ Familiarity with popular message queue technologies, including Kafka and RabbitMQ.
- ★ Practical knowledge of integrating message queues in Golang-based microservices
- ★ Ability to design and implement proof-of-concept projects to validate message queue functionalities.
- ★ Expertise in decoupling services and managing asynchronous communication for enhanced scalability.
- ★ Proficient utilization of Golang's features to optimize message queue integration and performance
- ★ Appreciation of the importance of fault tolerance and reliable communication in distributed systems.
- ★ Acquired knowledge of industry best practices for microservices and message queue implementations.

4.3 Phase Two: Live Project Involvement

During the second phase of my internship, I had the exciting opportunity to actively contribute to two live projects, ***Pi-Inventory*** and ***Financify***. Throughout this phase, I significantly contributed to the development of ***Pi-Inventory*** while gaining valuable insights into the structure and business logic of two additional ongoing projects: ***GPS-Tracker*** and ***CRUD Generator***.

4.3.1 *Pi-Inventory*

4.3.1.1 Description

The Inventory Tracking System (***Pi-Inventory***) is a crucial service within Project ***Financify***, responsible for efficiently managing and tracking the inventory of products to be sold. As a complementary component to another service within the project, it receives essential information, such as product orders and stock levels, to keep inventory data up-to-date.

- Efficiently tracks and manages inventory of products to be sold
- Receives essential information, such as product orders and stock levels, from another service within Project ***Financify***
- Acts as a central repository for all product-related information, including stock quantities, order history, and product details
- Ensures real-time synchronization of inventory data with the ordering service for accurate updates
- Provides comprehensive reports on inventory levels, stock movements, and product availability
- Intuitive user interface for authorized users to monitor stock status, track product sales, and forecast demand
- Incorporates automated reorder alerts and stock level notifications for streamlined supply chain management
- Enhances customer satisfaction by preventing stockouts and avoiding potential revenue loss
- Implements robust security measures, including access controls and user authentication, to safeguard sensitive inventory data
- Plays a pivotal role in ensuring smooth operations and efficient inventory management within Project ***Financify***.

4.3.1.2 Role and Contribution to the Project: Backend Team Member

As a dedicated member of the backend team within ***Pi-Inventory***, I played a pivotal role in developing and shaping the Inventory Tracking System (***Pi-Inventory***). Collaborating with a team of three, including the lead, I actively contributed to the project's success by taking on critical responsibilities and implementing key functionalities.

My role involved spearheading the implementation of several critical logics and core functionalities of the Inventory Tracking System (***Pi-Inventory)***. I took ownership of crucial components, effectively handling those complex tasks.

During my tenure as a key member of the backend team within Project X, I made significant contributions that were instrumental in the successful development and implementation of the Inventory Tracking System. My responsibilities included:

- ★ Designing and building APIs in alignment with the project's business logic, ensuring seamless communication and data processing within the system.
- ★ Playing a vital role in designing the database schema, optimizing data storage and retrieval for enhanced performance and efficiency.
- ★ Creating control flow diagrams for crucial APIs, providing clear visual representations of the system's functionality, and facilitating effective communication within the team.
- ★ Actively participating in meetings and gathering insights to identify project requirements and tasks for the backend team, ensuring alignment with the project's objectives.
- ★ Collaborating closely with the SQA and Frontend teams to identify and resolve bugs, ensuring a robust and error-free system.
- ★ Actively engaging with the Frontend team, catching and reporting frontend bugs, and actively participating in code refactoring as per new logic.
- ★ Contributing to shaping the overall business flow of the system, considering end-to-end functionalities, and aligning them with user requirements.
- ★ Providing support to team members, aiding in understanding the project's flow, and actively participating in code reviews to maintain code quality and consistency

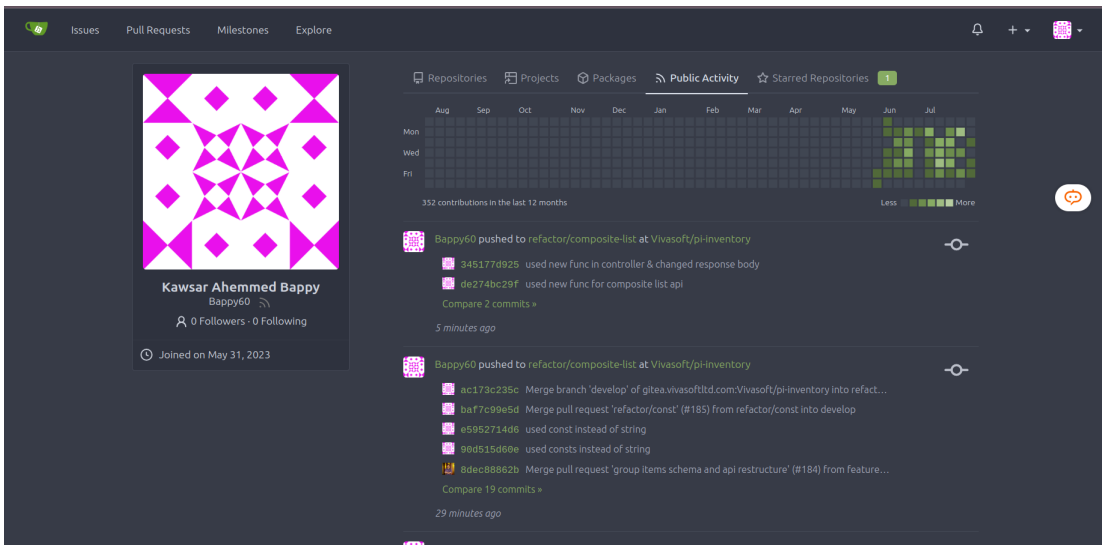

Figure 23: Contributions Map

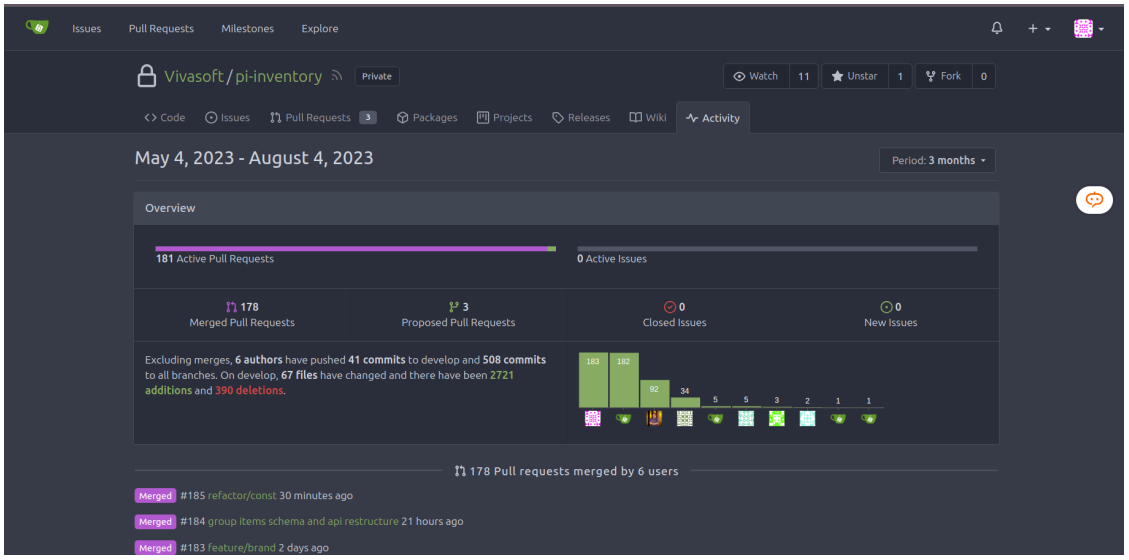

Figure 24: Activity (Number of Commits)

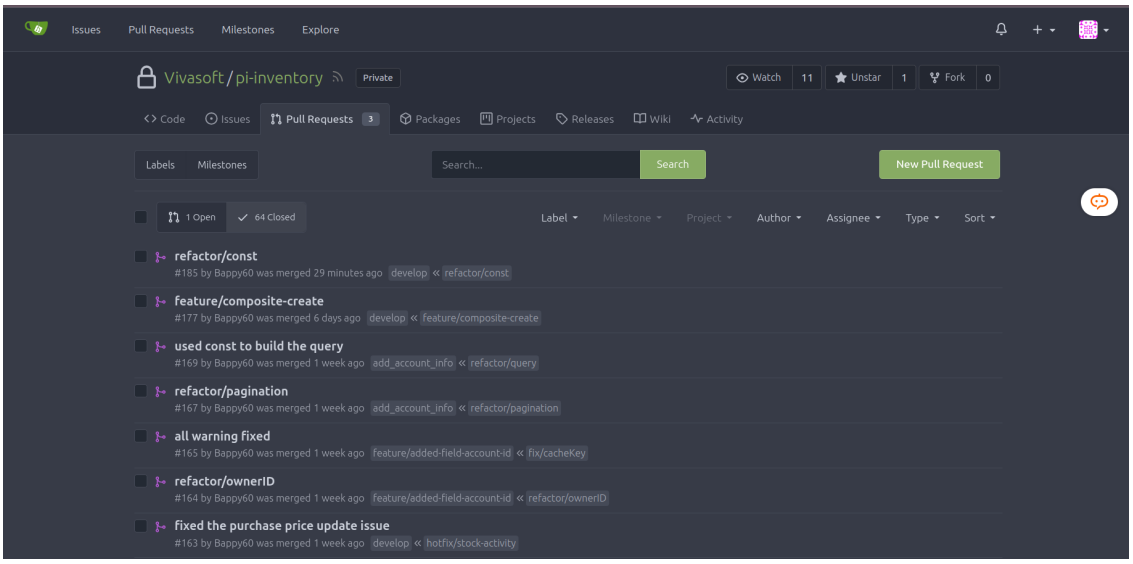

Figure 25: Activity (Number of Pull Requests)

My collaborative spirit, proactive problem-solving approach, and deep understanding of project requirements have consistently contributed to achieving project goals and ensuring a seamless user experience within the Inventory Tracking System of ***Pi-Inventory.***

4.3.1.3 Project Structure

The project structure is designed to facilitate efficient execution and organization of the application. When executing the project with the command "go run main.go server," the following steps occur:

- **Main.go:** Execution starts from the main.go file.
- **Timezone Setting:** The application sets the timezone to ensure consistent date and time handling across the system.
- **Configuration Reading:** Configuration files are read to fetch environment-specific settings, such as database credentials and server port.
- **Logger Initialization:** Logrus logger is initialized to provide comprehensive logging throughout the application.
- **Dependency Injection Container:** The Dependency Injection Container (DIC) is set up to manage dependencies and provide efficient dependency injection throughout the application.
- **DB and Redis Connection Checking:** The application verifies connections to the database and Redis to ensure smooth data access.
- **Command Execution:** The application uses the Cobra package to execute various commands based on user inputs.
- **Routing:** The application follows a **router**-> **controller**-> **service** -> **repository** -> **database** Repository pattern, where incoming requests are directed to corresponding controllers based on defined routes.
- **Controller Layer:** Controllers process the requests and invoke relevant services to execute business logic.
- **Service Layer:** Services encapsulate business logic and interact with repositories to fetch or manipulate data.
- **Repository Layer:** Repositories handle data access, interacting with the database to perform CRUD operations.
- **Database Operations:** The application performs database operations and interacts with the underlying database using the chosen ORM or SQL library.
- **Server Execution:** The application sets up the router and starts the server, listening on the port specified in the environment files.

This structured data flow ensures a seamless and organized execution of the application, allowing for easy debugging, maintenance, and scalability.

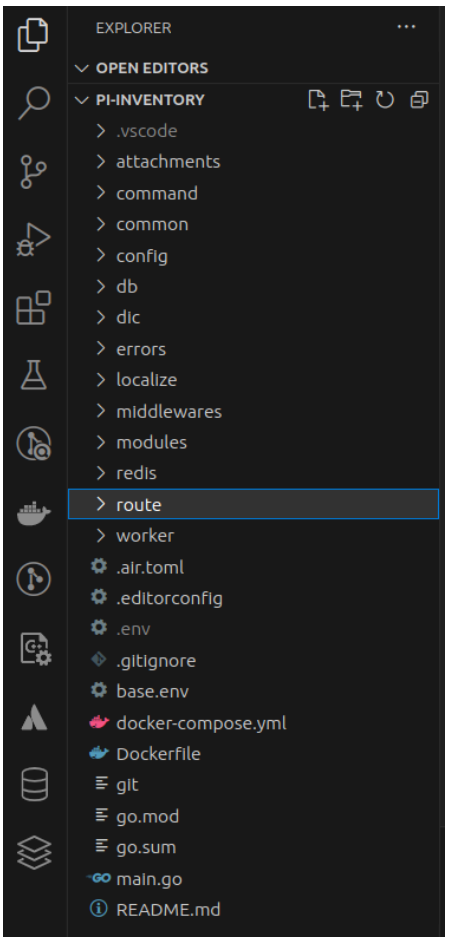

Figure 26: Pi-Inventory Structure (Backend)

4.3.1.4 Tools and Technologies

Backend:

- ★ Language: **Go (Golang)**
- ★ Framework: **Gin**
- ★ Database: **PostgresQL**
- ★ Cache: **Redis**
- ★ ORM: **Gorm**
- ★ Cloud Storage: **AWS S3**
- ★ API endpoints: **REST API**
- ★ Clean Architecture: **Repository Pattern**
- ★ HTTP Request Router: **Gorilla MUX**
- ★ Validation: **Ozzo validation**
- ★ Containerization: **Docker**
- ★ CI/CD Pipelines: **Genkins**
- ★ Authentication: **JWT** (JSON Web Tokens)
- ★ Dependency Injection: **DIC** (Dependency Injection Container)
- ★ Configuration Management: **Viper**
- ★ Command Line Interface: **Cobra** package
- ★ Logging: **Logrus** for comprehensive logging

- ★ API Documentation and Testing: **Postman**
- ★ Version Control: **Gitea**

FrontEnd:

- ★ Framework**: NextJs**
- ★ Design Tools: **Figma**

4.3.1.5 Project Visualization

The "Project Visualization" section showcases the visual representation of the project's key components and user interface. It includes screenshots and images that provide an insight into the application's design, layout, and user experience. By incorporating frontend photos, this section aims to present a clear and engaging view of how end-users interact with the system.

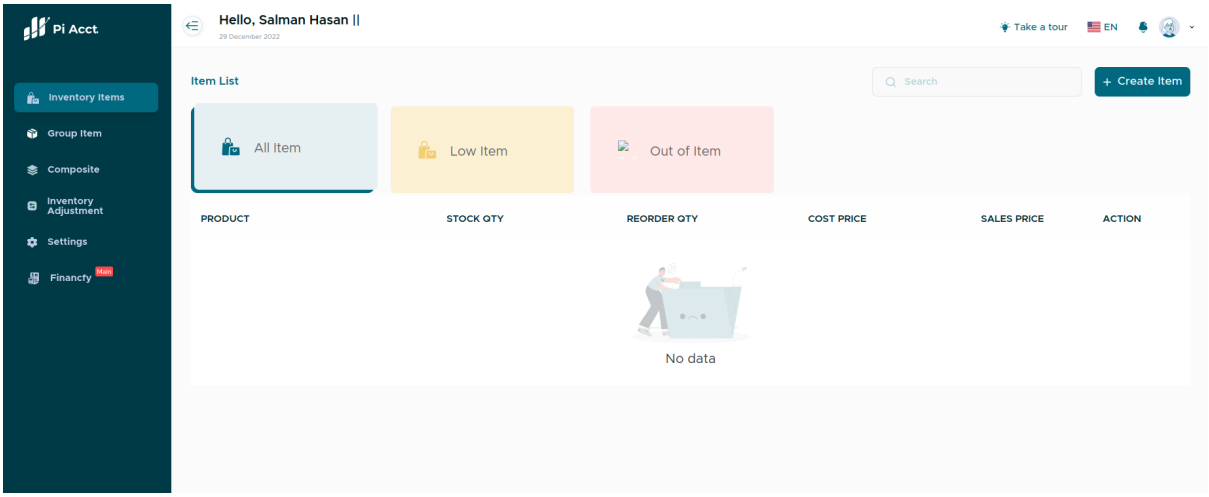

Figure 27: Home Page/Dashboard of Pi-Inventory Service

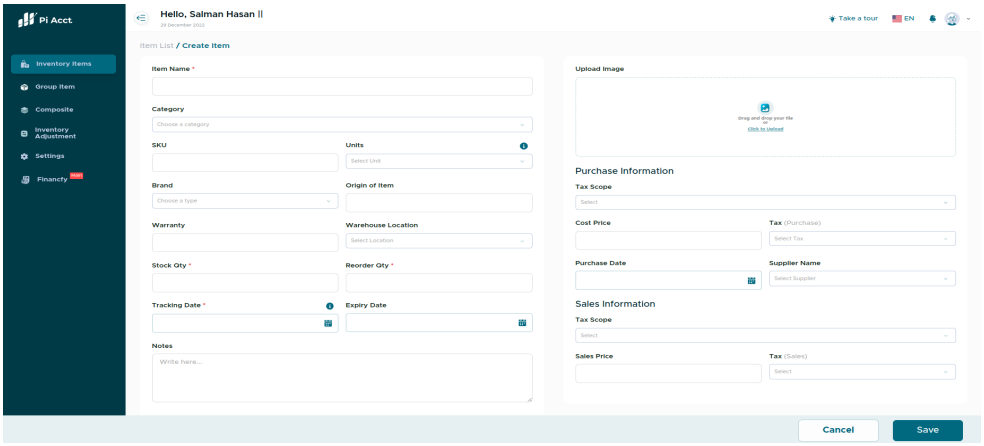

Figure 28: Item Create Page

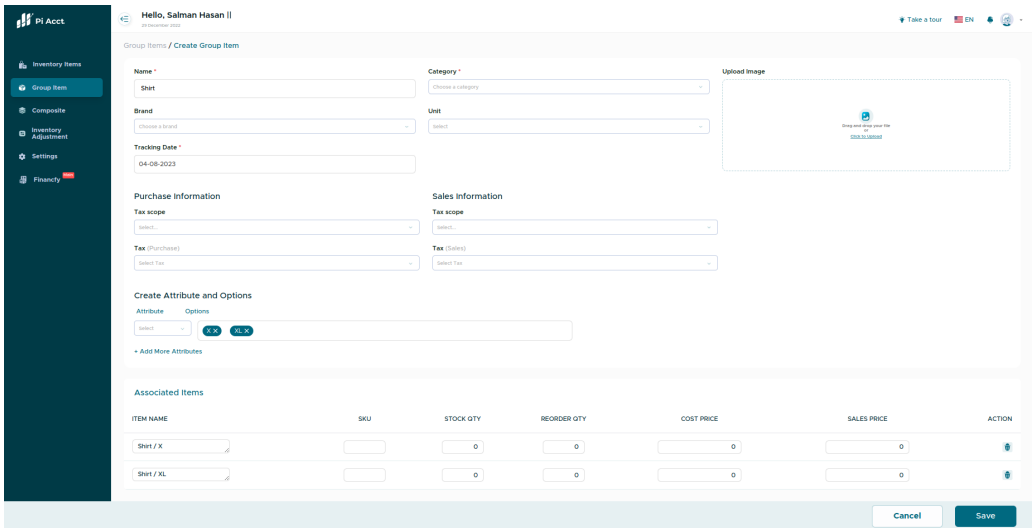

Figure 29: Group-Item Create Page

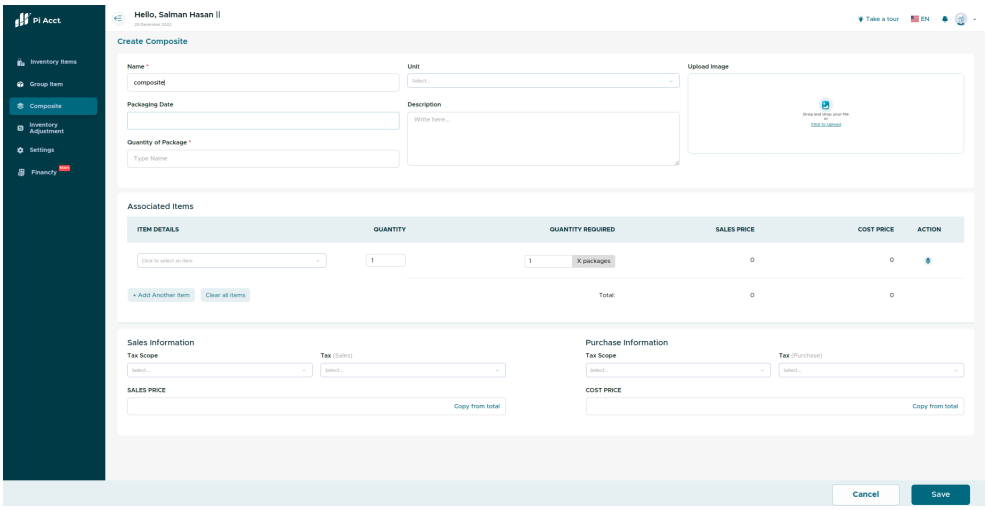

Figure 30: Composite-Item Create Page

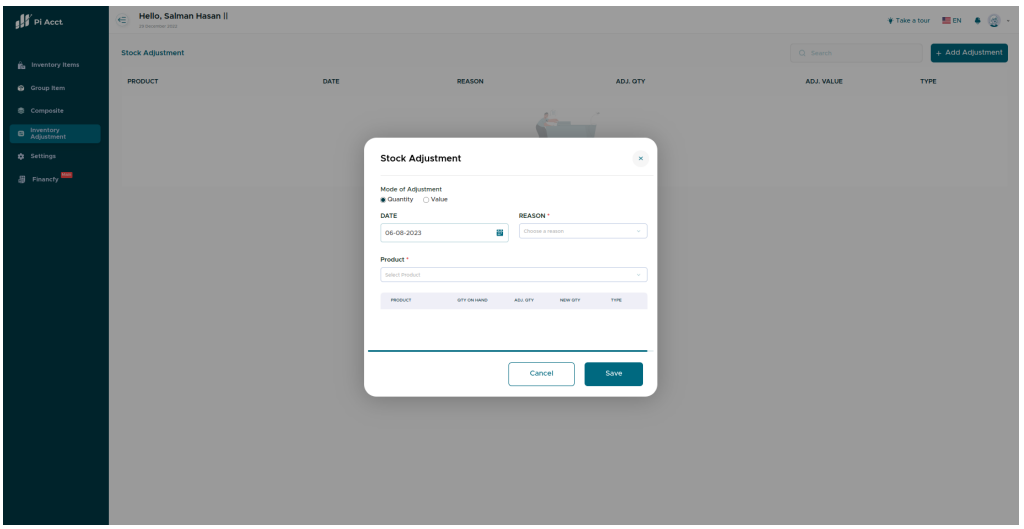

Figure 31: Stock Adjustment Page

Due to confidentiality and NDA restrictions, specific project visuals cannot be shared in this report, as they contain sensitive data. However, it is important to note that the provided photos are indeed relevant to the project, but have been carefully selected to ensure they do not contain any sensitive information in order to maintain data confidentiality.

4.3.1.6: Major Learning Focus

- ★ Language: **Go (Golang)**
- ★ Framework: **Gin**
- ★ Database: **PostgresQL**
- ★ Cache: **Redis**
- ★ ORM: **Gorm**
- ★ API endpoints: **REST API**
- ★ Clean Architecture: **Repository Pattern**
- ★ HTTP Request Router: **Gorilla MUX**
- ★ Validation: **Ozzo validation**
- ★ Containerization: **Docker**
- ★ Authentication: **JWT** (JSON Web Tokens)
- ★ Dependency Injection: **DIC** (Dependency Injection Container)
- ★ API Documentation and Testing: **Postman**
- ★ Version Control: **Gitea**

4.3.2 *Financify*

4.3.2.1 Description

The account management system is a comprehensive platform designed to handle user accounts, authentication, and authorization. Additionally, it integrates with an inventory tracking system, which efficiently manages product orders and tracks inventory levels. This combined solution provides users with a seamless experience, enabling them to manage their accounts, access relevant services, and track inventory information in real-time. The system's robust features ensure secure data management, streamlined workflows, and accurate inventory control, enhancing overall operational efficiency and customer satisfaction.

4.3.2.2 Role and Contribution

I primarily worked on ***Pi-inventory,*** which is a service of Project ***Financify***, focusing on

- API integration
- Addressing a specific challenge related to sharing a single Redis container among different service containers

Even though I only directly contributed to Pi-inventory, I still learned a lot about managing API integrations and understanding Redis container sharing concerns. My efforts in ***Pi-inventory*** complemented the overall project objectives and enhanced collaboration between various service components, facilitating seamless data communication and improving system performance.

Due to confidentiality and NDA restrictions, specific project visuals, structures,and diagrams cannot be shared in this report as they contain sensitive data.

4.3.3 Gaining Insights into Diverse Projects and Architectures:

During my second phase of live project involvement, I actively sought opportunities to expand my knowledge beyond the projects I directly contributed to. As part of my curiosity-driven approach, I took the initiative to learn about the structure, flow, and business logic of two ongoing projects that were also in GoLang within the organization, even though I was not directly involved in their development.

GPS-Tracker:

The GPS-Tracker Software Project is a powerful system that gathers real-time data from GPS-enabled hardware and provides users with valuable insights and detailed information. It receives location updates from the tracker hardware and processes them efficiently to ensure up-to-date data availability. Users access the system through an intuitive interface, which offers

- live tracking,
- historical location playback,
- geofencing
- customized alerts.

Robust security measures safeguard sensitive data, and its scalability makes it suitable for various applications, from fleet management to personal tracking. The GPS-Tracker Software Project stands as a versatile solution, empowering users with real-time tracking and actionable insights for improved decision-making and efficiency.

By closely observing the codebase and engaging in discussions with the development team, I gained valuable insights into

- GPS-Tracker's architecture and overall design
- In-depth understanding of load-balancing mechanisms
- Practical knowledge about the functioning of Api-Gateway
- How the four services were communicating with each other using RabbitMQ
- Understanding the flow of data and interactions between various modules allowed me to grasp the project's technical intricacies.

This experience exposed me to different coding patterns, best practices, and architectural choices, contributing to my understanding of building scalable and maintainable applications.

CRUD Generator:
Similarly, my engagement with this provided me with an opportunity to explore a distinct project with its own unique challenges and solutions. Analyzing the project's business logic and understanding the rationale behind certain design decisions broadened my perspective on the diversity of software development approaches.
The CRUD Generator Project is a dynamic tool that streamlines backend development by generating the structure and CRUD (Create, Read, Update, Delete) operations for multiple programming languages. Through user-friendly terminal commands, developers can swiftly create the foundation of their projects, eliminating repetitive manual coding.

Upon receiving user input, the generator intelligently constructs the backend architecture, including models, controllers, and database interactions, tailored to the chosen programming language. This enables developers to kickstart their projects efficiently, focusing on business logic rather than boilerplate code.

The CRUD Generator supports various languages, empowering developers to effortlessly create APIs and backend systems in their preferred language. Its versatility enables seamless integration into diverse tech stacks and frameworks.

By automating the generation of CRUD functionalities, this project accelerates development cycles, reduces errors, and enhances code consistency. As a result, developers can rapidly prototype and iterate, delivering robust and scalable applications with ease. The CRUD Generator Project stands as a valuable asset in modern software development, promoting efficiency, code reusability, and time-saving practices for developers across different languages and frameworks.

Gaining Cross-Project Knowledge:

By immersing myself in these ongoing projects, I was able to appreciate the significance of cohesive and well-structured codebases. This exposure enhanced my ability to navigate and contribute effectively to complex projects, further solidifying my understanding of backend development in diverse environments.

4.3.4 Exploring DevOps Basics and Cloud Services in Live Project Environments:

My second stage of involvement in a live project gave me the opportunity to work closely with a DevOps engineer who graciously shared their knowledge and skills in DevOps processes and cloud services, with a particular focus on AWS (Amazon Web Services). Additionally, I took the initiative to self-motivately learn and deepen my understanding of these crucial aspects to complement my backend development skills.

DevOps Basics:

Collaborating with the DevOps engineer provided me with valuable insights into DevOps principles and practices. I learned the basics about continuous integration and continuous deployment (CI/CD) pipelines, automated testing, version control, and deployment strategies. Understanding the significance of seamless collaboration between development and operations teams, I gained a broader perspective on streamlining the software development lifecycle.

Introduction to AWS Services:

With guidance from the DevOps engineer and through self-learning, I delved into the world of cloud services, primarily focusing on Amazon Web Services (AWS). I explored essential AWS services, such as **Amazon EC2** for scalable computing and **Amazon S3** for object storage. Acquiring knowledge about these services enriched my understanding of cloud computing's practical applications and benefits in modern software development.

Chapter 5: Things I Learned At Vivasoft Ltd.

At Vivasoft, I developed both technical and non-technical talents. I picked up a lot of ideas from academia, such as the fundamentals of software engineering, but I never learned how they applied in practical situations.

My technical proficiency will be enhanced, and I'll learn software industry best practices as the main objectives of this internship. As a result, it is important to discuss the technical breakthroughs I made throughout this time. I couldn't master them all at this time, but I did make a lot of progress.

5.1 Technical Skills

I've utilized the following technologies while working at Vivasoft, and some of them are described below:

- Concepts
  - HTTP and RESTful services
  - Microservice Architecture
  - Interservice Communication
  - Caching
  - Load-Balancer
  - Api-Gateway
  - Foreword & Reverse Proxy
  - Authentication (JWT)
  - Authorization
  - Cloud Services (AWS services: **EC2, S3**)
- Languages
  - GoLang
- Frameworks
  - Echo
  - Gin
- Database
  - MySQL
  - PostgreSQL
  - Redis
- Tools
  - Postman
  - VS Code
  - Git/Github

    - Gitea
- Technologies
    - Containerization: Docker

5.2 Non-Technical Skills

5.2.1 Professionalism

Professionalism refers to how someone conducts themselves in a work or commercial environment. Environments in universities and software farms are highly dissimilar. The employees at Vivasoft are really smart. Everyone I worked with was friendly and knowledgeable. Such behaviors continuously encourage me to pay attention to what I am doing and to learn more about it. This helps me change my viewpoint by teaching me that there is always more to discover and understand.

5.2.2 Punctuality

During my internship period, I learned the importance of punctuality as a crucial professional attribute. Being punctual not only reflects responsibility but also demonstrates respect for others' time and commitments. It helped me meet deadlines and maintain an efficient workflow within the team. Embracing punctuality has positively impacted my work ethics and fostered a reliable and dependable image in the workplace.

5.2.3 Communication

Effective communication skills are essential for success on the professional level. Internships offer students the best chance to improve their communication abilities. At Vivasoft, I've met smart people who specialize in various tech stacks. I figured out how to approach anyone and beg for help. Social events like lunches, sports, farewells, and recreational activities also made it easier for me to meet new people and communicate with them.

5.2.4 Knowledge Sharing

At Vivasoft, my instructors were always available whenever I had a question. They had always been aware of our requirements and had led us in the right path. They repeatedly exhorted us to discuss the subjects we were eager to learn about and gave us examples of how much more we could learn if we conversed and shared. To further distribute information among the staff members, numerous face-to-face and online knowledge-sharing workshops were held.

5.2.5 Quality of Work

Maintaining high standards of work ethics and making every effort to keep them high are essential. I have learned how to uphold the code quality, conventions, and guidelines in order for my contribution to the projects to have a positive reputation.

5.2.6 Planning Before Doing

Before starting a task, I have always shared my plan for doing the task with my team leader or Mentor. The art of planning is figuring out what you're going to create, which helps me understand the task deep down. I have stated some of the planning techniques below:

- Analyzing the task properly
- Identifying the aim of my plan
- Create a roadmap to do that
- Sharing my thoughts with the person in supervision
- Evaluate the plan and its impact
- Documenting the final plan
- Implement the strategic plan

5.2.7 No blaming

The creation of software is always a collaborative endeavor. Additionally, no two team members have the same set of abilities or expertise. This also applies to Vivasoft. I made a lot of blunders throughout my internship, such as failing to maintain clean code, reusable methods, and code organization. and occasionally spending many hours on a single issue. However, neither my team leader nor my mentors had ever treated me harshly. They always told me to ask for assistance if I got stuck for a while. But they held off on fixing the issue until it was absolutely necessary. They almost always offer a solution to that issue.
The workplace's health can be maintained very effectively by using this method. Problems cannot be solved by placing blame on others for their errors.

Chapter 6: Conclusion

Even though my internship at Vivasoft lasted only six months in total, it was a lovely experience from the start! When I finally saw how well prepared they were for the interns, I was astounded. From the first day of my internship there, Vivasoft had already designed a really successful internship program. I had the privilege of being able to start by learning the very basics of Backend development. As time went on, new technologies that are important for any kind of Backend development service were introduced to me.

I have had the strong impression that Vivasoft wants us to be the best throughout my internship. There is no other option other than going for the best approach and practices in Vivasoft. The feedback regarding my internship at Vivasoft has been overwhelmingly good. Additionally, I want to draw attention to a few things that would facilitate the journey of subsequent interns.

The environment of the Vivasoft workplace assignment is extremely lovely. In Vivasoft, there is no manager who will frequently look after you because they believe in the idea of self-management. To complete the assignment, it is up to each individual. Anyone in the room can offer assistance. Everyone is incredibly kind and eager to assist anyone at any time. I could therefore work stress-free and at my own pace.

Even though I was only an intern, I felt like I was working there full-time. It is very wonderful that I was given all the benefits of a regular employee. Because of this, Vivasoft was a really welcoming place for myself and other interns. Great facilities like tea, coffee, lunch, and afternoon snacks were offered to all of us. Additionally, the office setting is quite tidy and clean.

I am also content with the compensation they offer. According to the facilities we were given, I find them to be very reasonable and satisfying. I received a monthly salary offer of BDT 18,000 for a full-time internship, and it became very simple and easy to collect the money because they opened an account for me and transferred the funds there.

On the last day of our internship at Vivasoft, they also presented us with gifts wishing the interns success in the future, which also proves the friendly culture Vivasoft practices and holds.

I would suggest Vivasoft for an internship if one wants to learn, develop, and push himself to the limit. Its customs and culture are comparable to those of any reputable international software industry. Vivasoft has a solid grasp of the norms of corporate life around the world.

Additionally, Vivasoft arranges training for its employees as needed or upon demand. So, in my opinion, it's one of the best places in Bangladesh to begin a software engineering internship or career, or to advance in that career.

Chapter 7: References

1. “About Us”, https://www.Vivasoft.com/en/about-us
2. “What is Scrum?”, https://www.scrum.org/resources/what-is-scrum
3. “Postman”, https://www.postman.com/
4. “Docker”, https://www.docker.com/
5. “Http”, https://developer.mozilla.org/en-US/docs/Web/HTTP
6. “Liberio”, https://github.com/Bappy60/BookStore_in_Go
7. “e-Shopify” https://github.com/Bappy60/ecommerce_in_echo
8. “Vivasoft Bootcamps” https://academy.vivasoftltd.com/