



Daffodil
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University

Internship at Kona Software Lab Ltd.

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This internship report has been submitted in partial fulfillment of the requirement for the degree of Bachelor of Science in Software Engineering

Department of Software Engineering
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Approval

APPROVAL

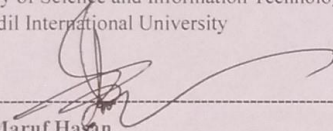
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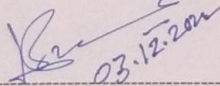
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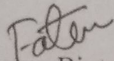
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Declaration

I'm Mohammad Ismail Alam student of Daffodil International University with ID 191-35-2793. Under the supervision of Ms. Fatama Binta Rafiq, Department of Software Engineering, I successfully doing my internship at Kona Software Lab Ltd. I am stating the obvious that I didn't prepare this report prior for any other reason, incentive or presentation by someone else then myself. It is also notified that none of the information for numerous websites and source included in this research is plagiarized.

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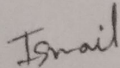
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Chapter 1: Introduction

1.1 Background

An internship allows students to evaluate their interest in a specific field. It is also an opportunity to apply their academic understanding to difficult real-world environments. When the internship is completed and the students return to the job world, the abilities they have acquired throughout the internship assist them achieve a stronger performance.

As an intern, we have the opportunity to learn how to apply academic knowledge to practical projects. It provides us with sound information on the latest technologies. We discover the knowledge gaps that separate us from other employees. We have the chance to learn about the lifestyle and best practices of experienced developers. How to live a professional life and how employees interact with one another when working in a team.

Students gained familiar with the organizational hierarchy of designations. Understanding of the many roles and duties within an organization grows. At the conclusion, a student gains effective % communication skill and gets ready for working in the real world.

Bachelor of Science degree is 4 years at Daffodil International University (DIU) and it contains 12 semesters. After completing my 11 semesters I was also offered to take an internship program at Kona Software Lab Ltd. (KSL)- a business wing of KONA I. which is the subject of this report. It covers the entire period of my internship journey.

1.2 Motivation

In IT sector and job market in order to survive or advance our professional competence it is important to have theoretical and practical knowledge. The internship period is helping to apply the theoretical knowledge on real world. With the theoretical knowledge when we start applying the theory in practically it clears the knowledge. In intern period we can get the real-life experience and get known how an industry work, how they working as a team in a project. The major motivation is deploying self-skills. I decided to pursue an internship as my career for this reason. In field of software development, I get to know that Kona Software Lab Ltd is ranks among top 4 banking card manufacturers in the world. In Bangladesh, KONA serves more than 30 banks and owns 50% card market share.

KONA has a fantastic reputation for customer satisfaction and services.

1.3 Objectives

The primary objective of this report is to present an overall description of the internship program at KONASL. This report is a short description of my 6 months internship carried out as compulsory component of the BSc in Software Engineering program.

1.3.1 Objective

- To represent the valuable experience gained through the internship program to gain experience in the workplace, leading in the development of practical skills and self-assurance.
- To acquire and implement the practical knowledge in the job.
- To improve interpersonal, management, and communicative abilities.
- To develop potential tactics for gaining a competitive advantage.

1.3.2 Specific Objective

- To mention the industrial practices, I have learnt
- To describe the technical skills, I have acquired
- To describe the tasks, I have accomplished
- To describe the real-life projects, I was involved
- To highlight the technologies and the software development process adopted by KSL
- To present the services provided by KSL
- To describe the environment of KSL
- To describe the facilities provided by KSL to their employees and interns
- To describe the joining process.

1.4 Scope of the report

This report represents the experiences and learnings I have earned throughout the 6-months long internship program. In this report, I tried to illustrate the overall procedure of Software Development System in a corporate environment I went through. In addition, I illustrated the KSL's mission and vision, management, partners, clients, company culture, technology, development methodology, my position and team activities, etc. I focused on my involvements and my experience of working in real life projects. How team members work together in a real-life project, how the team members play their individual role, the process of adaptation with the company culture and technologies are described here. The report concludes with the description of my technical and professional growth after the internship program.

1.5 Methodology

The report is prepared from my personal experience at KSL as an intern and collecting information from websites and documents provided by personnel of the company. The resources of collected data are given below:

1.5.1 Primary data

- Personal experience and observation gathered from different events and activities at KSL.
- Collaboration with teammates and colleagues.
- Seminars attended where the employees used to discuss about current technologies.
- Sections attended where the employees used to teach about current and new technologies.
- Team outing in every month.

1.5.2 Secondary data

- KSL official website.
- KSL policy guides.
- KONA I web pages
- Listening from HR and project manager
- Blogs of KSL.
- Glassdoor
- LinkedIn

1.6 Limitations

Information is provided in this report with respect to company policies and taking permission from the authority, as the company policy is highly sensitive about sharing internal information outside of the company. So, I am bound to present my project involvement in brief. I am not allowed to discuss the technical details here. Moreover, all the data given in this report could not be validated. Besides gathering data from KSL employees was also a tough job. It was quite hard to get time from them in the busy business hours.

Chapter 2: KONA I (Parent Company)

2.1 Introduction

KONA I Co Ltd is a South Korea-based company with headquarters located in Yeongdeungpo Gu, Seoul, South Korea. Company started back in 1998. They supply IC cards with their COS to about 90 countries overseas including Bangladesh, and they are ranked No. 1 in the domestic share and No. 4 in the overseas market. They have over 100 product certifications and field certifications, including VISA, MASTER, JCB, AMEX, etc., to provide products and services tailored to your needs.

EMV-based Global Platform Development: In March 2004, Kona I supplied a global platform-based java card, Kona, to Busan Bank for the first time and, in July. And it was selected as a promising export small and medium enterprise and acquired ISO9001:2000 quality assurance system certification. EMV certification: Kona I acquired the EMV certification, the international standard for IC cards. In 2006, Kona I ranked first with the largest market share in the domestic smart card industry. And it has been leading the digital authentication technology by developing the world's first Combi USIM and supplying the electronic ID card.

Launched the KONA card: Kona I registered as the electronic finance business in 2015 and evolved into a global IT company by launching the KONA card in 2017, the nation's first open rechargeable mobile/IC card platform. Local currency platform: In 2018, KONA I launched the first IC card-type local currency platform in the western area of Incheon in Korea, entering the local currency business, and operating card-type local currency platforms in more than 60 municipalities across the country based on a local community platform that provides excellent scalability and excellent user convenience. In addition, they are expanding their area into a comprehensive platform company by linking various platforms such as payment, DID, mobility, healthcare, Metabus, blockchain, and data.

2.2 Business Area

KONA I is currently operating their business based on various types of services which they can divide into eight major categories. Those categories and their little description are provided in the next subsections.

2.2.1 Digital Identification

Kona supplies security modules with KONA I's chip OS and applet to card manufacturers and issuers around the world.

- Smart IC Chip: KONA I supplies security modules with KONA I's Chip OS and Applet to card manufacturers and issuers around the world.
- Smart Card
- Electronic Card: KONA I manufactures a variety of security-enhanced electronic cards, including biometric authentication.
- Authentication Service: Kona authentication service is a service that combines PKI technology with secure elements to authenticate objects or people.



Figure: -1: Different type of cards

2.2.2 Blockchain Platform

- Kona Chain: Kona Chain is an enterprise blockchain platform solution based on Hyperledger Fabric.
- Dap Service: Dap service is based on blockchain technology, it protects user personal information, so that user can freely express his opinions. Transparency and security of the results are guaranteed.

2.2.3 Business Wings

KONA-I have international sales offices and technical centers in almost 40 countries across the world such as in the United States, China, India and Bangladesh as well as local offices in Nigeria and Brazil. KONA I's global network is the driving force capable of swift responding to the demand of the global markets. Some of the countries are listed below:



Figure-2: Kona I business wing across the world

Chapter 3 KONA Software Lab Ltd

3.1 Introduction

Kona Software Lab Ltd. (KSL) was founded in 2012. Since then KSL has been working as the R & D center and global solution business wing of KONA which has over 22 years of dominant international presence. Currently KSL consists of 120+ employees. It is located at the beautiful place at Hatirjheel bridge, Gulshan-1. With its location, employee's friendly behavior, enough hardware and internet facilities, food and entertainment make its environments productive. It provides various business and security solutions as well as digital platforms. The notable business solutions are Nexus Pay and Nagad.

Their software products ranging from operating system of microprocessor to payment systems escalating to billions of users and transactions all around the globe. Our focused development areas are:

- Smart Card
- Blockchain as service based on Ethereum and Hyperledger
- Digital Payment Solutions
- Secure element based on IoT Security

3.2 Company History

KSL history starts from 2012 when it started its journey. Since then KSL has gone through many changes and stages. This section discussed some of those stages briefly.

- 2012: KSL established as an R & D center of KONA I Co. Ltd.
- 2013: Formation of Payment Lab and Security Lab, each focused on its specific line of research and development.

- 2014:
 - A. Inception of Solution Business wing to conduct the sales and marketing activities of the solutions and platform products of the company across markets.
 - B. Conceptualization and development of a Cloud-based Contactless Payment Platform (branded as “KonaPay”) based on the specifications of international payment brands—VISA, Mastercard.
 - C. Developed Public Key Infrastructure (PKI) based products, e.g. Middleware, Certificate Authority, Secure Mail with Digital Signature, Secure File Transfer, and so forth.
 - D. Participated in CARTES Secure Connexons (now “TRUSTECH”)—the largest European event in the payment and security industry—in Paris, France and showcased the payment and security products of the company.

- 2015:
 - A. Participated in Mobile World Congress (now “MWC Barcelona”) in Barcelona, Spain and showcased the products of the company.
 - B. Launched KonaPay Digitization Platform in Seoul, South Korea.
 - C. Participated in Money20/20—the largest event in the USA, focusing Payments, Banking, Fintech and Financial Services—and launched KonaPay Digitization Platform in the Product Announcement program.

- 2016:
 - A. Successfully migrated the MULTOS card platform of Dutch-Bangla Bank Limited to Java card platform.
 - B. Developed Kona Money Digitization Platform (product name “Kona Card”) and launched it in Seoul, South Korea.
 - C. Contract with Dutch-Bangla Bank Limited to deploy the first-ever Cloud-based Contactless Payment Platform in Bangladesh.

- 2017:
 - A. Deployed Nexus Pay, the Host Card Emulation (HCE) based digital mobile wallet solution, for Dutch-Bangla Bank Limited.
 - B. Piloted QR-based payment at the cafeteria of Bank Asia Limited.
- 2018:
 - A. Deployed the Digital Financial Service Platform (product of Bangladesh Post Office, named “Nagad”) for Third Wave Technologies Limited (TWTL).
 - B. Registered the Tokenization module of KonaPay Digitization Platform with EMVCo as Token Service Provider.
 - C. First contract with a Bangladeshi bank for the Brand Test Tool (BTT) of UL IMS.

3.3 Technology Partnership

- Reseller Partnership with Underwriters Laboratories
- In September 2015, Kona Software Lab Ltd. signed a contract with the Transaction Security now “Identity Management & Security”) division of Underwriters Laboratories (UL) in Singapore as its official reseller of Brand Test Tool (BTT) and EMV Personalization Validation Tool (EMV PVT) in South Asia region.
- ASAP Partnership with Thales
 - In 2015, Kona Software Lab Ltd. signed off on an official agreement with Thales UK Limited for its Alliance for Solution & Application Providers (ASAP) program to form a technological and business relationship ensuring mutual benefit by jointly driving the marketing activities.

Chapter 4 Governing body

I would like to introduce honorable three persons from whole governing body of KSL.



Figure 3: Company Hierarchy

Cho Chung-il from Korea positioned as Chairman of KSL, Minoar Hossain Tanzil and Topu Newaj are from Bangladesh positioned as Managing Director and Executive Vice President respectively. Full organization chart given below.

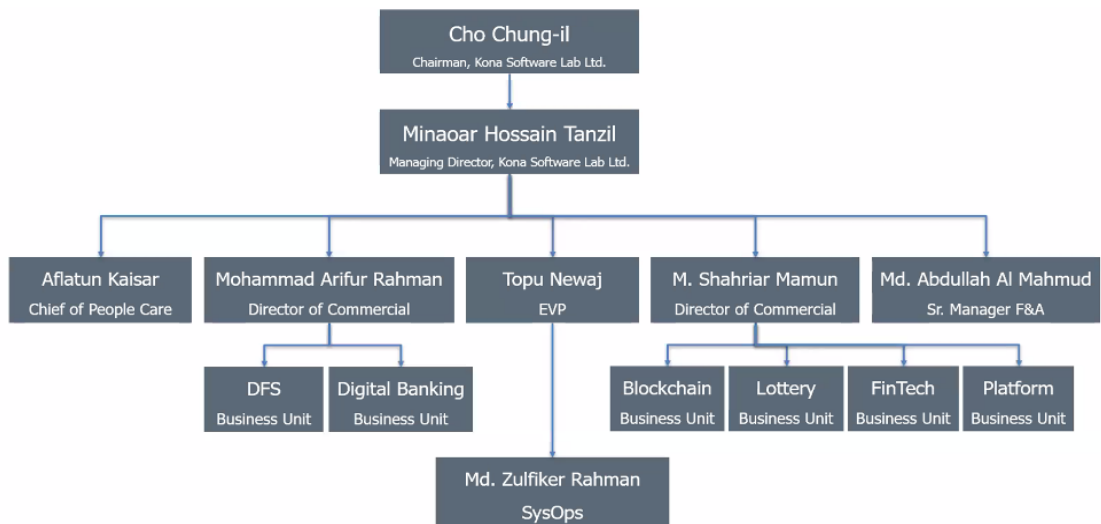


Figure 4: Chain of KSL

4.1 Tech Stack

KSL is currently working on many projects as described in section 3.4, products and solutions. Different technologies, frameworks and languages are being used here for different projects. Java as an Object-Oriented Programming (OOP) language along with spring boot framework being used here almost all projects as backend applications tool. Raw JavaScript, jQuery library, react are also used for frontend development. Latest HTML (Hyper Text Markup Language) and CSS-3, Bootstrap are used for web page rendering and styling respectively. Microsoft teams, Microsoft outlook, Gitlab, Git, Jira, Wiki sites are some of the frequently used tools in KSL.

4.2 Products & Solutions

4.2.1 Digitization Platform

- **Kona Pay:**

KonaPay digitization platform can digitize any payment and non-payment card as well as account (bank account, mobile money account, etc.). This is a secure, scalable, robust, flexible, and futureproof platform developed with a target of improving efficiency and quality of financial services to promote financial inclusion and reduce payment processing cost and time.

- **Kona Card:**

KONA CARD PLATFORM is a card payment platform that built upon Kona's unique smart card security technology and know-how. Built to be compatible with EMV standards, it offers payment services to any business owner who wants to issue digital currency safely and independently without depending on financial institutions. Through the KONA CARD PLATFORM, prepaid mobile and IC smart cards may be issued instantly. Additionally, it can function to provide memberships, 14 season vouchers, tickets, discount coupons, etc. The platform includes everything needed to run a card payment service on a single platform from the issuance of cards to the approval and settlement of transactions.

- **Kona DFS:**

KONA DFS is a tailor-made solution catered to the needs of any service provider willing to implement and serve the unbanked people in its market that has significant amount of cash movement, wide availability of mobile phones and low penetration of smartphones. KONA DFS is focused to security along with flexibility and comfort of end-users.

4.2.2 Smart Card and Personalization

Financial institutions need payment methods that are convenient and secure at the same time. Kona, I offer various solutions sought by financial institutions at a reasonable price. So, Kona I provide 5 services in this area.

1. EMV (International Payment Standard) card issuance product: All the product lines of Kona I are based on the Java card technology. That's why they are capable of and fast at developing and providing smart card applications to respond to customers' demands.

2. K-CPS (Kona Card Perso System) IC card issuance solution: Kona CPS (Card Perso System) is an IC card issuance solution capable of management of lifecycle of IC cards and applications. It's available on open platform (JAVA, Multos) and, for closed-loop cards and compatible with small and large perso systems.

3. K-IIS (Kona Instant Issuance Service) card issuance solution: Kona's Instant Issuance Service (also known as KIIS) is a one stop solution for instant personalization and issuance of a payment card. It empowers a bank's branch to issue payment cards in a very short time while providing the same level of information security and cryptographic operations as a traditional personalization bureau. This provides a competitive edge to the bank with instant service to its customers. Banks also save on inventory and delivery costs using instant issuance. Customers benefit as well by cutting down on the wait period before they receive their payment cards.

4. K-EVT (EMV Verification Tool): EMV global standards offer a great benefit to card issuers, acquirers and cardholders in terms of security and interoperability. Quite often card issuers will follow the EMV and payments brand defined specifications (MasterCard/Visa/China UnionPay etc.) when personalizing a batch of payment cards.

5. K-ECVS (Electronic Card and Validation System).

However, once personalized, it is highly recommended to test the card and its personalization process before delivering to the cardholder. Failure to comply with a proper testing process for the personalized payments cards risks the card issuer's reputation, customer dissatisfaction, and failed transactions for the issued cards.

4.2.3 Security Solution

1. Governments and public organizations need stronger security solutions to protect misuses of any official certificates and documents. And Kona I's I based ID card and relevant solutions satisfy all security requirements.
2. K-CCS (Chip to Cloud Server) is storage designed to safely store and utilize important information in SE Array in the form of hardware as SE becomes larger and more high performance.
3. KONA Authentication Service is an authentication service based on a Dual Interface Card consisting of KONA Cert, KONA Check, and KONA PKI System.
4. FIDO U2F is a 2nd factory authentication solution that is more convenient and safer than existing means of 2nd factory authentication.
5. PKI, based on ID recognition solution, may be purchased by all-in-one packages including Java Card applet, PKCS Microsoft CSP Middleware, and Certificate Management Tool, etc., and also customized depending on the needs of customers.

Chapter 5 Life At KSL

KSL considers the contribution of its people as the fuel of their innovation. Company respects countries' rules and culture. They observe every special day with nice decorations, special foods and events. Here, in this section some facilities are listed.

5.1 Learning and Professional Growth Opportunity

Kona SL is an ample opportunity for learning and professional growth. Every fresher who joins KSL must go through some learning process. Some latest technologies are a new concern at KSL including microservice, blockchain. To ensure freshers have basic knowledge about those technologies, experienced developers at KSL take sessions on this topic. They provide assignments and after submission evaluation takes place. Besides attending these compulsory sessions, there are some optional topics such as security, git is presented by experienced developers. Anyone can join it and enrich their knowledge in that field.

5.2 Monthly Team Outing Allowance

A monthly allowance is given to all employees of KSL considering their motivation for team building other than official works. This allowance is called team bonding allowance. The amount is BDT 1200 per month per employee. On a certain day fixed by the team leader they all go out to the nearest place such as a restaurant to spend this allowance money.



Figure 5: A picture of Team-Outing

5.2.1 Annual Family Tour

An annual family tour is arranged to enrich and refresh KSLians' minds. This tour takes place in some cool places in Bangladesh. It takes two or three days to complete this tour. During the tour all the employees stayed in a festive mood.

5.2.2 Holidays and Paid Leave

- Weekly holidays: All Saturday and Sunday are treated as weekly holidays. However, different holidays are also applicable for employees providing service on roaster.
- Public holidays: All the gazette holidays declared by the government of Bangladesh are treated as the official holidays of Kona SL.
- Leave: All the employees of KSL are entitled for 16 days' total leave in each English calendar year with full pay with the approval of immediate superior and departmental head. This paid leave will not include weekly and public holidays.
- Sick leave: An employee may apply for sick leave only when he is sick and unable to attend work. KSL has the provision of 14 days' Sick leave in a year. For prolonged illness, an employee can avail additional sick leave if it is needed.
- Maternity leave: A female employee is granted maternity leave for a period of 120 days.
- Paternity leave: A male employee also can avail paternity leave for a period of 5 working days.
- Awarded leave: If any employee works more than total hours in a month, s/he will be awarded annual leave against per 8 working hours.
- Leave without pay: leave without pay may be granted to an employee in special circumstances when no other leave is available as entitlement.

5.2.3 Transport Facilities

KSL provides transport facilities to all its employees'. Transport systems are provided in different routes. The official transportation timing is fixed. Entry time is 8:30 and exit time is 6:00.

5.2.4 Breakfast Lunch and Snacks

KSL provides complimentary breakfast between 8:30 to 9:30. It also provides subsidiary lunch between 12:30 to 2:30. In the evening KSL provides snacks. An employee can avail dinner if she/he stays in the office till 10 PM.

5.2.5 Sports & Entertainment

Every day, after 5 PM KSLian engage themselves playing indoor game table tennis. KSLian playing table tennis KSL also attend intercompany cricket and football.

5.3 Dedicated Unit

KSL has rented the entire 8th floor of Police Plaza to provide the seating arrangements for its employees. Each team is given a block that is entirely theirs. Product owner, team lead, developers, UX designers and quality assurance engineers of a dedicated team sit in their own block. It ensures proper team member cooperation and collaboration. And it is expected that any team member who is stuck in any step of the development process will shout for assistance from the rest of the team.

5.3.1 Comfortable Sitting Arrangement

Because developers often spend long periods of time sitting in the same chair and staring at a computer screen, KSL provides them with comfortable desk chairs that can be adjusted to their height.

5.3.2 Office Schedule

KSL provides employees with flexible time schedules. Official working days are from Sunday to Thursday. Although employees are supposed to work 8 hours per day, a complete day is defined as anyone who arrives at the office before noon and leaves after four in the afternoon according to the time recorded on their punch card. Employees are allowed to take breaks during their workday and are not supposed to work under pressure.

5.3.3 Dress Code

In KSL, there is no fixed uniform. The majority of the workforce is dressed formally. However, wearing unconventional attire to the office is not permitted. It is not permitted to wear clothing with logos from rival software companies or other businesses in the office.

5.4 Organized Structure

KSL operates under a structured corporate framework. A predetermined official process is used for all official tasks. In the event of leave management, the employee must complete a leave application and obtain the team lead's approval before it can be approved.

5.4.1 Sprint Planning

As mentioned above each team is closely managed by one product owner. As KSL follows agile software development process, development phases are divided into sprints. Normally sprints contain two weeks that is 10 working days. At the starting of each sprint, development requirements are identified and development process is planned in presence of all team members. After that product owner and team lead divide the sprint into small stories and breaks the small stories into tasks. Each task is assigned to individual team members and it is the duty of the team members to fulfill the task within given time schedule.

5.4.2 Daily Stand Up

Every morning, the team leader hosts a daily stand-up meeting to which all team members have to present. The standup plays a significant role in development, since all team members clarify their dependencies on others' efforts. Each team member must also state what he did yesterday, what he will do today, and whether he requires the assistance of other team members. As a result, the entire team is informed about the current progress of the project and shares their own knowledge.

5.4.3 Co-operation

Every KSL employee is cooperative and helpful. Not necessary, just team members assisting one another. If an employee gets stuck at any point, he or she may even seek assistance from a senior member or an expert from another team. As huge projects are developed concurrently, all team members collaborate to deliver a successful demo at the conclusion of each sprint.

5.4.4 Friendly Environment

I have almost spent 4 months as an intern in KSL. All the members did no differentiate us with other employees. All the members are very friendly. They help us to adapt with the new changes and challenges. And this friendly environment helps us to refresh our minds while working for hours.

Chapter 6 Departments

6.1 Admin

There is a dedicated admin department consisting of 8-10 employees. The Admin department works across all departments and all kinds of work.

- General Office Management
- Asset Management
- Transport Management
- Security and Safety Management
- Human resource Management
- Food Management
- Salary management
- Events management

These are some common tasks which are managed by the admin department.

6.2 IT support department

The IT support department maintains the company's computer networks. This unit provides technical support and ensures the company's efficient operation. The IT support department is responsible for installing new resources, installing software, fixing network issues, and setting up settings, among other tasks. When an employee experiences a technical problem with his computer, he contacts the IT help department immediately through Microsoft Teams. In response to this call, the IT support team handles the issue either physically or remotely, depending on the severity of the problem.

6.3 Development Department

Employees of this department are called developers. They directly write software code. This department is split into different teams such as blockchain team, QA team, machine learning team etc. Scrum meetings are held every morning by each team. Every team is responsible for developing a specific software project by collaborating with the team members. Designing, coding, testing, releasing are some jobs done by developers.

6.4 Recruitment process

Fresher as well as experienced people can join KSL. Joining process is straightforward. People from different technologies are encouraged to submit an application. After primary screening applicants are called for some test process held at KSL premise.

1. Written Test: This test includes some basic questions such as OOP concept, Security, Database etc.
2. Hands-on Test: This test basically includes a programming test. Applicants are given one problem and expected to solve them using his convenient programming language.
3. Technical Viva: Those applicants who perform well in hands-on tests are called for a technical viva.
4. Final Viva: Finally, applicants have to face another viva with managerial body. After successfully passing those tests one is eligible to have a joining offer.

6.5 Major Clients

From history, we learned that KSL deals with lots of products and solutions from its journey in 2012. Till now 2022 KSL identified all of its clients as shown in this picture below.



Figure 6: Renowned Clients

- Nagad
- Nexus Pay
- Mercantile
- Kona Card
- DBBL
- City Bank
- EBL
- IFIC Bank
- EXIM Bank
- Trust Bank
- Jamuna Bank

Chapter 7 Internship at KONA Software Lab Ltd

7.1 Overview

The practice of on-the-job training known as an internship is excellent for students who are majoring in technical courses. An internship serves as a link between academia and industries. It helps the organization reach out to the next generation of talent while also allowing the students to become familiar with industry trends. Through internship programs, businesses can draw in potential employees and develop them in line with their own development strategies.

Being a part of KSL intern group makes me feel privileged. The curriculum assisted me in applying my knowledge in the real world and in becoming informed of the information needed to thrive in the field.

7.2 Facilities for Intern

Like any new employee, we were warmly welcomed by all of the KSL members. We were introduced to the other employees. We were treated just like any other employees of KSL. In the beginning, the team lead kept a close eye on us as he shared his knowledge, gave us valuable time, and helped us get used to the company's surroundings and new technologies.

Following are some of the facilities that we were offered in KSL

1. Dedicated workspace like any other employee
2. Individual PC and other facilities
3. Healthy amount of remuneration
4. Smart coding tips from team lead

7.2.1 Other facilities for Intern

1. Opportunity to get familiar with new tools
2. Opportunity to work in real life project
3. Become a member of real-life project team
4. Flexible working time
5. Leave for academic activities
6. Flexible working environment

7.2.2 Evaluation of Intern

Every academic program concludes with an assessment process. A form with questions about my professional and technical skill development, work quality, timeliness, and analytical abilities are provided to KSL as part of my internship program's evaluation. The evaluation procedure is carried out by my supervisors and team lead. And this feedback is really valuable to me because it indicates both my strengths and my areas of improvement for the future success of my career.

Chapter 8 Learning Phase

8.1 Overview

In our academic careers, we study a variety of technologies and theories. It is not feasible to apply this knowledge to actual industry activities within this time frame. Thus, an internship as part of a student's academic program plays a crucial role in the learning process. As an intern at KSL, my supervisor assisted me in overcoming this challenge by teaching and familiarizing me with new tools for managing the overall process. I got around 15 days to learn required tools and technologies to become valuable for the team.

8.2 Learn Spring Boot

On the first day of my internship, my supervisor told me to learn about the Java-based framework Spring Boot. He provided me with some YouTube playlists and resources so that I could learn fast. He also mentioned that I had to do a project as well so that they could evaluate my learning process. During this learning phase I learned about spring, dependency injection, inverse of control, various annotations, ORM, JPA, hibernate, MVC, etc.

8.2.1 Assignment Projects

- CRUD operation Base Project using Spring Boot.
- Library Management System using Spring Boot.

8.3 Learn HTML, CSS, Bootstrap, JavaScript, React

After successfully completing the assignment, my supervisor again provided me with some resources about Front-end developers. He continuously guided me so that I could accomplish my tasks.

8.3.1 Assignment Projects

- Main project Sign Up Page
- Main project Manual Payment UI
- Making Templates
- Web Design
- Making something using HTML, CSS, Bootstrap

Chapter 9 Project Involvement

9.1 Project Description

CRYPTRADE is an online cryptocurrency exchange marketplace where users buy, sell, and trade cryptocurrency. Crypto exchanges work similar to online brokerages, as users can deposit fiat currency (such as U.S. dollars) and use those funds to purchase cryptocurrency. Users can also trade their cryptocurrency for other cryptocurrencies, and some exchanges allow users to earn interest on assets held within the exchange account. CRYPTRADE offers a wide array of trading features, including an impressive selection of market charts and different types of cryptocurrencies. Users can also access a variety of trading options including internal and external, as well as several order types. Supported Cryptocurrencies on CRYPTRADE: CRYPTRADE has 2 cryptocurrencies available for trading. Those are

1. Bitcoin
2. Ethereum

Initially CRYPTRADE only support one fiat currencies which is Korean won (KRW). CRYPTRADE has its own cryptocurrency called KONA coin. This cryptocurrency still in development phase. Cryptocurrencies Trading: CRYPTRADE offers a various type of trading, including real-time monitoring. Users can place trades through the CRYPTRADE app, CRYPTRADE mobile web, or CRYPTRADE desktop website. Traders can also use the CRYPTRADE platform to access their portfolios and trade history, as well as view the order book and price charts. Strictly CRYPTRADE has 4 major types of trading for both bitcoin and Ethereum.

1. Internal to Internal: In internal-to-internal trading, the seller will create an internal offer. It means the seller will sell coins from his internal wallet. When the buyer accepts this internal offer and chooses an internal wallet to receive coins, the coins will be delivered from the seller's internal wallet to the buyer's internal wallet.

2. Internal to External: In internal-to-external trading, the seller will create an internal offer. It means the seller will sell coins from his internal wallet. When the buyer accepts this internal offer and chooses an external wallet to receive coins, the coins will be delivered from the seller's internal wallet to the buyer's external wallet.

3. External to External: In external -to-external trading, the seller will create an external offer. It means the seller will sell coins from his external wallet. When the buyer accepts this external offer and chooses an external wallet to receive coins, the coins will be delivered from the seller's external wallet to the buyer's external wallet.

4. External to Internal: In external -to-internal trading, the seller will create an external offer. It means the seller will sell coins from his external wallet. When the buyer accepts this external offer and chooses an internal wallet to receive coins, the coins will be delivered from the seller's external wallet to the buyer's internal wallet.

Users of CRYPTRADE can also share cryptocurrencies with each other.

1. Internal Send coin: One user of CRYPTRADE can send coins to another user of CRYPTRADE. There, the coins will be sent from one internal wallet to another internal wallet.

2. External Send Coin: Users of CRYPTRADE can send another user's external wallet.

3. Receive coin: Users of CRYPTRADE can receive coins from another user's external wallet.

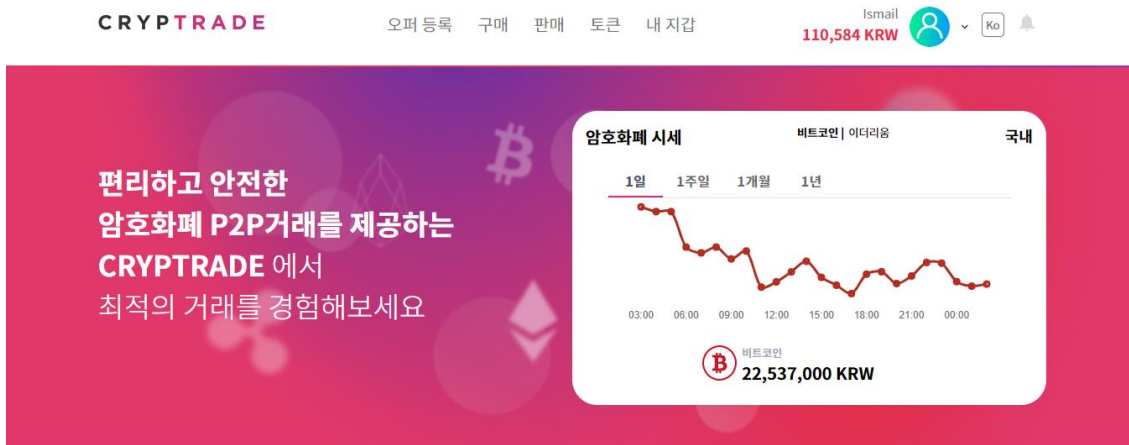


Figure 7: Home page of CRYPTRADE

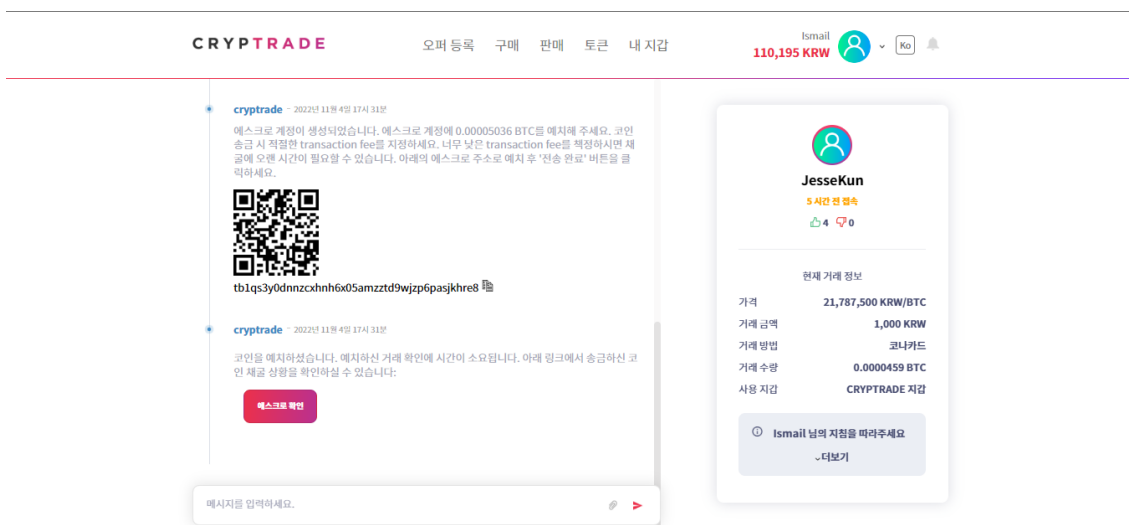


Figure 8: Trade Feed Page of CTYPTRADE

Chapter 10 Tools and Technology

Tools and technology used by this project are described here.

10.1 Libraries and Frameworks

- JavaScript
- Java
- Gradle
- Spring Boot
- React

10.2 Tools

- IntelliJ IDEA
- GitLab
- Git

10.3 Database

Postgres

PostgreSQL is a powerful, open source object-relational database system with over 35 years of active development that has earned it a strong reputation for reliability, feature robustness, and performance.

10.4 Job Role

CRYPTRADE had some complex scenarios like cryptocurrency trading, trade cancellation, coin sending, user registration, etc. The developers had to frequently test those scenarios when they implemented a new feature or made code modifications. In addition, the developers were required to carry out dev testing before each sprint release, and after each sprint release, the SQA members were also required to manually test those features. My team lead put me on the front-end team and assigned me as a front-end developer. I solved various major and minor bugs, provided improvements, and implemented important features.

1. Back End Developer
2. Front End Developer

Chapter 11 My Contributions (Front End Developer)

11.1 Overview

After one n half months of continuously performing my job as a Backend developer, my team lead decided to shift me from the automation team to the frontend team. The front-end team was divided into 2 sub-teams: web version development team and the app development team. For this reason, there were resource limitations in the web version development team. So, I got the opportunity to contribute to the project as a front-end developer. In the last one n half month I dedicatedly contributed to the front-end team. I frequently attended multiple meetings with the front-end team. They were very flexible and cooperative. They helped me to understand the code structure and code flow. In this period, I solved many bugs, provided improvements to existing features, and finally got an opportunity to implement a feature.

11.2 Bug Resolution

SQA members were continuously testing projects. When they find an error, failure, bug, or a difference between what was asked for and what was done, they report it to the JIRA, and the team lead takes care of it. The team lead was in charge of assign these reports to the right developers. When I understood the front-end code well enough, the team lead started assign bug reports to me to fix. My teammates as well as SQA members always helped to understand the bugs. Sometimes they also told me what approach I should apply to solve specific bugs.

An Approach to Bug Resolution

- First of all, I read the whole bug description carefully. If I didn't understand, I would get help from the team lead and SQA members.
- Try to reproduce the bug again.
- Analysis of the bug, comparing actual and expected results. Design an optimal solution.
- Find out from which code module the bug is actually occurring.
- Go to that code module and find the accurate file.
- I implemented my solution to that file. Again, testing the feature and checking if me solution had any cause and effect or not.
- If a partial effect is found, then redesign the solution. Ensure that during the bug solution it will definitely not produce another new bug.

I have solved a lot of major bugs like-

- Text change and alignment issues.
- Requirements mismatch.
- The loader is not working.
- Number text field takes more than one dot.
- Text overflow.
- Notification pop menu not closing etc.

11.3 Improvement

SQA members asked for improvements if they thought some existing feature or component should be improved. They also report improvements in JIRA if clients change requirements for existing features.

I resolved improvements. major improvements that I provide.

- After user registration, users directly go to the dashboard rather than asking for login.
- Improvements to the dropdown option select.
- Improvement on the offer registration page.
- Improvement on the trade feed page.

Chapter 12 Feature implementation

At the sprint planning meeting, the team lead told the front-end team to integrate two-factor authentication for both the web and app versions. So, there I was, getting the opportunity to implement two FA for the web version. And we also have to restructure the signup page of our project.

I had to integrate two types of two fa (with help of others). Sign Up page by my own

Google Authenticator: To enable Google Two-FA, the user will scan the QR code with the Google authenticator app. A QR will be displayed on the UI. After scanning the QR code, the authenticator will show a 6-digit code. Now the user has to input that code into the UI input field.

Mobile SMS: To enable SMS Two-FA, the user has to add a valid phone number in the account settings. A 6-digit OTP code will be sent to that number. Now the user has to input that code into the UI input field.

Sign Up for Web Version: The older sign up page wasn't created in a standard structure way. So that in several its take time to implement other work throw the sign-up page.

Manual Payment: User can add multiple accounts in that site. Previously only one card can add.

Some screenshots of my work are shown below.



Figure 9: 2Fa

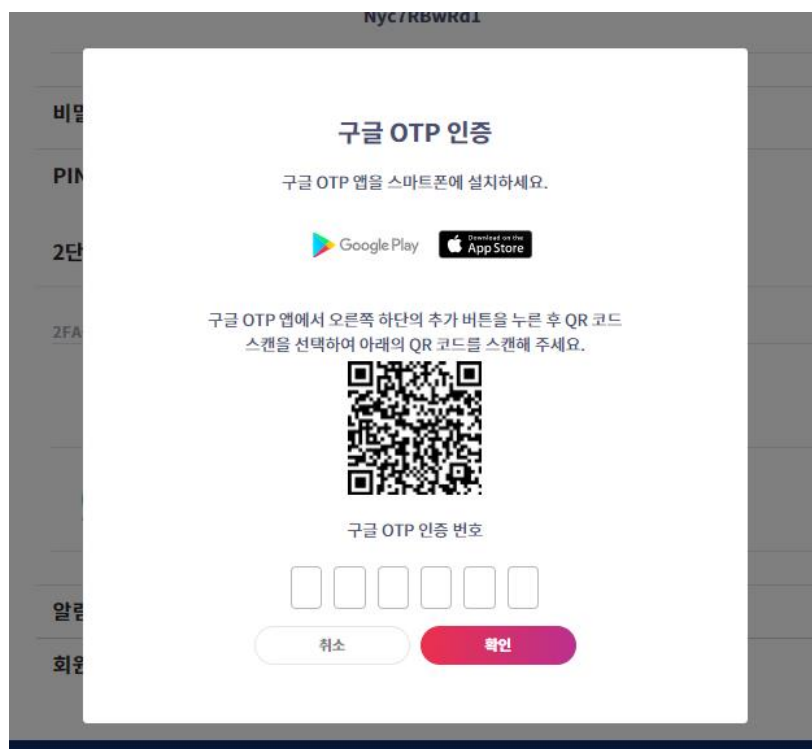


Figure 10: Google 2Fa

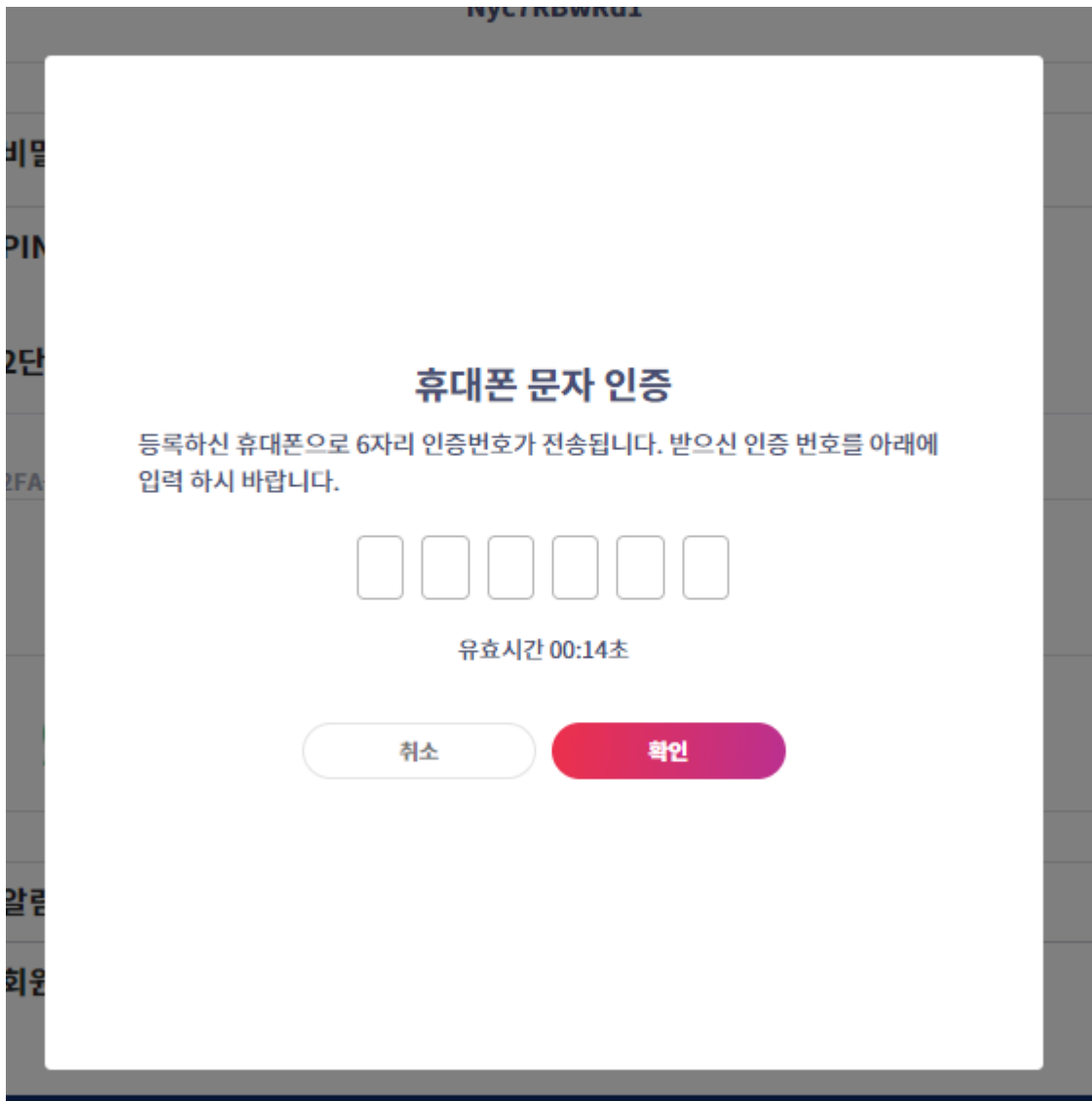


Figure 11: SMS 2FA

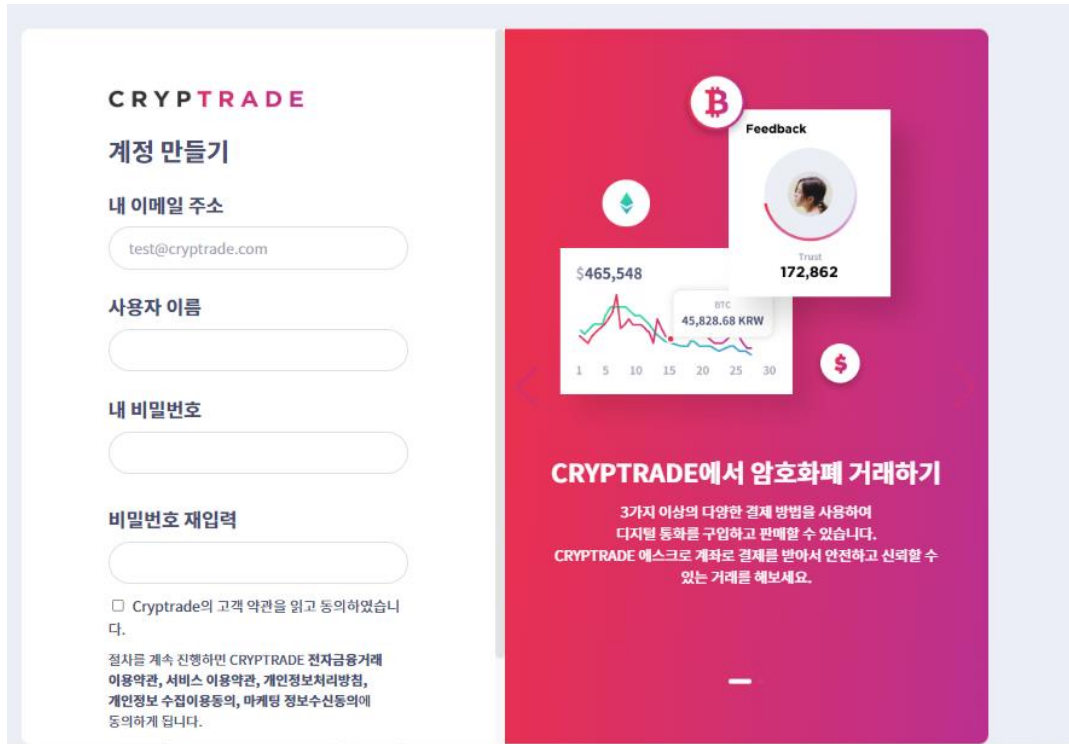


Figure 12: Sign up Page

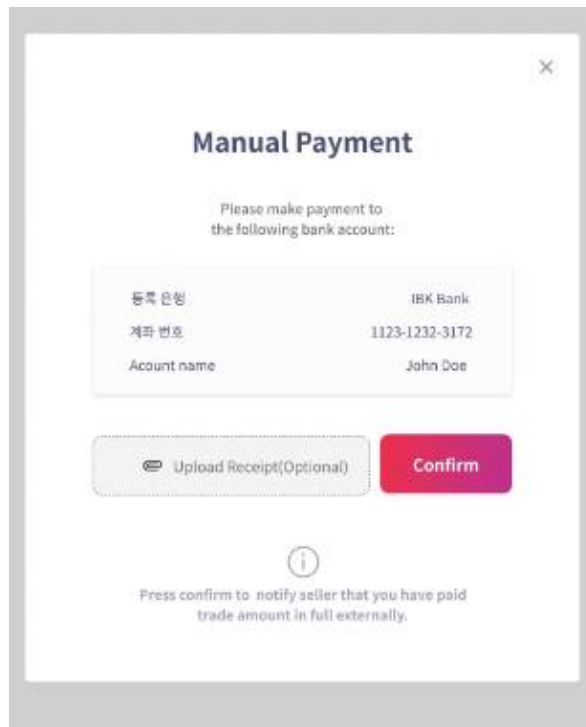


Figure 13: Manual Payment

Chapter 13 Professional Growth

13.1 Development Technique

When I first started doing my development tasks, I was a complete newbie and had many questions and concerns. However, because KSL employs an agile methodology, we are able to do research and development at any time when we face new challenges. Our team lead and senior members are consistently available to guide our professional growth. The daily scrum helps me stay current on the project's state and new technologies. Due to the project's size and the fact that everyone is working on distinct modules, no one has a complete understanding of another module. Therefore, team members schedule knowledge-sharing meetings.

13.2 Pair Programming

Two programmers collaborate at the same workstation using the agile software development technique known as pair programming. It enables us to exchange knowledge and identify errors more quickly. In comparison to programmers working alone, pairs often find more design alternatives, arrive at simpler, more maintainable designs, and identify design flaws earlier. Pairs of programmers typically finish a task more quickly than one coder working alone. So, while resolving issues with my teammates, I gained knowledge of the pair programming method.

13.3 Respect for Each Other

Respect for one another is essential in the workplace. A guy must respect his coworkers in order to obtain respect. This fosters a healthy environment among the members, and a helping hand from seniors is always available.

13.4 No Bullying and Blaming

Teamwork is essential in the software development process. And when people work as a team, misunderstandings happen very commonly. But I've never seen my team leaders or project managers be harsh to people they were in charge of. I've made a lot of errors and mistakes in the last 4 months. But I had never been treated badly by my project manager. Putting the blame on other people doesn't help to solve the problem.

13.5 Dedication for Work

Learning was my primary motivation for working at KSL as an intern. Thus, a works commitment to their task is a crucial factor in the workplace. Each person must complete their assigned tasks within the deadline.

13.5.1 Attitude

The work ethic of my seniors absolutely amazes me, and I hope to adopt it myself as an intern in order to become a successful Software Engineer and a successful man. They are always aware of what to say, how to say it, as well as when to make a choice or make a change. They have excellent social and communication skills. The way in which they approached their job, the people on their team, and most significantly, the work that they did, had a significant impact on me.

13.5.2 Negotiation

An essential component of software engineering is negotiation. Here, the developers frequently bargain with the product owner. The fact that each team member is free to express their viewpoint on a particular issue is a positive aspect of KSL. The team as a whole then collaborates to find the best solution to their issue. Here, negotiating with senior citizens is viewed as knowledge exchange.

13.5.3 Organizing

One of the best ways of learning how to organize is to start organizing oneself of his/her own and after spending almost five months at KSL I should say that I am a much more organized person only by practicing that principle. And now being organized myself, I can say that I am ready to organize others.

Chapter 14 Self-Assessment

14.1 Overview

In this section I will share my perspective on my accomplishments as an intern. I'll evaluate the skills I developed and developed during my internship. My supervisors filled out a form that was given to KSL as part of the intern evaluation process. Based on those qualities, I would evaluate my own capabilities.

14.1.1 Attitude

At work, I maintain an enthusiastic attitude at all times. Whenever I work on something, I give it more of my attention and energy than it actually requires. When it comes to representing IIT and my company, I always do what my team leader asks of me. Therefore, I have always experienced a significant deal of enthusiasm for my work.

14.1.2 Ability to learn

For the past 4 months, I have worked in a dedicated team. Therefore, I always make an effort to get knowledge from my teammates. Every day, my team lead gives me interesting tasks to do and tells me how to do them. So, I'm very grateful to everyone on my team, especially my team leader, for helping me learn things so well.

14.1.3 Dependability

At KSL my supervisor found me sincere in my learning phase so I got the chance to be assigned in a real-life project within a month of joining KSL. They found me fully dependable and I am trying my best to carry on my image.

14.1.4 Initiative

I am constantly excited to be handed new, challenging tasks. Consequently, at the time of sprint planning, I consult with my supervisor in order to be assigned my favorite task. Consequently, I had the opportunity to work with multi-tenant systems, bug resolving, system design, apply design pattern, two factor authentications. I discovered myself performing my work independently and without struggle.

14.1.5 Quality of work

My team's leader has remarked on more than one time that the quality of my work is satisfactory. I would think that some of the courses that I took at IIT, such as software architecture, web technology and design pattern, are to responsible for this. These courses taught me how to figure out requirements at the very beginning stage of development and how to write clean code.

14.1.6 Judgment

I didn't have much chance to make decisions in KSL. But I took the decisions of my own works like – prioritizing the assigned tasks, implementation details and sometimes functional behavior of the software feature.

14.1.7 Overall performance

I would say my performance was outstanding in KSL. Because, in this 5 month I have become a trusted body for my co-workers. They find me to be dependable and rely on me. The responsibilities assigned to a person can define his/her performance. And I have got many responsibilities towards my project and my co-workers. This expresses my performance at KSL.

Chapter 15 Conclusion

It has been four months since my joining at KSL since September 01 2022. I remember the very first day at KSL, the HR department took us to every lab and I were introduced as the youngest employees at KSL. Afterwards, Aflatun Kaisar, Chief of People Care, Software Lab Ltd., told us that they do not expect too much from me. I should maintain office time, learn the environment & culture and enjoy other facilities. They keep their words throughout those four months. I never feel pressure by them or my project manager, Md. Saiful Islam, Head of Technology, Kona Software Lab Limited. Again, my cordial respect for them.

I joined a real project, CRYPTRADE. This project was managed by Headquarter, Korea. I went through many discussions with them over online to get a clear understanding about what we are going to develop. Requirements changed many times and I, with the team members, changed our codebase accordingly. Implementing changes is always hard. After every release I got a great relief. To refresh our mind, I used to go out for tea, outings and small tour.

Those activities helped us develop friendship and communication. I have learned many technologies, frameworks, libraries, tools and concepts that enriched my knowledge. I am successfully accustomed to professional company culture. I had a very good time at KSL. Internship is undoubtedly an important program of Daffodil International University that will help one to proceed towards the future with confidence.

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