Report On Internship
SWE - 405

Submitted to

Department Of Software Engineering
Institute of Information & Communication Technology, SUST

Submitted by

U Chai Aye marma
2017831053
Session: 2017-18

Performed at

Dynamic Solution Innovators Ltd.

Submission date: 16 July, 2022

Letter of Transmittal

July 16, 2022
The Director
Institute of Information and Communication Technology
Shahjalal University of Science and Technology

Subject: **Letter of Transmittal**

Dear Sir,

It's a great pleasure to me to submit my internship report that you have asked for. I have been working as an Intern at '**Dynamic Solution Innovators Ltd.**' on 4/1 semester as a part of our course, **SWE-420**. This report contains my experience in the company. It is based on my learning and experience during my internship time period, starting from September 01, 2021 to February 28, 2022. During this period, I have trained under the supervision of **Mojahedul Hoque Abul Hasanat,** Chief Technology Officer at Dynamic Solution Innovators Ltd. and **Md. Nafis Tihami**, Associate Software Engineer, Dynamic Solution Innovators Ltd.

I believe this report will be quite interesting and fulfil your expectations. I have tried to give my best efforts to prepare a comprehensive report. I will be grateful if you accept my report and your kind consideration will be highly appreciated.

Sincerely yours,

U Chai Aye marma
Reg Number : 2017831053
SWE, 4th Year, 1st Semester
Institute of Information and Communication Technology
Shahjalal University of Science and Technology

Letter of Endorsement

To Whom It May Concern

Subject: **Approval of the Report**

This letter is to certify that all the information mentioned in this document is true and not confidential to the company. The projects mentioned here have had successful involvement of U Chai Aye marma, Institute of Information and Communication Technology, Shahjalal University of Science and Technology.

I wish her all the best and hope that she will lead a successful career.

Internship Supervisors,

Mojahedul Hoque Abul Hasanat
Chief Technology Officer
Dynamic Solution Innovators Ltd.

Md. Nafis Tihami
Associate Software Engineer
Dynamic Solution Innovators Ltd.

Acknowledgment

Firstly I am really thankful to the Institute of Information & Communication Technology, SUST and its Intern Program Authority for arranging the wonderful internship program for me. I am also grateful to Dynamic Solution Innovators Ltd. for recruiting me as an intern.

I would like to express my heartfelt gratitude to **Prof. Dr. M. Jahirul Islam** the Director of Institute of Information and Communication Technology, Shahjalal University of Science and Technology for running the internship program and giving me the opportunity.

I also would like to thank honourable teacher **Fazle Mohammed Tausif**, Assistant Professor, Department Of software engineering,SUST, for his contribution and hard work in getting us admitted to different companies.

I am extremely grateful and remain indebted to CTO of Dynamic Solution Innovators Ltd, **Mojahedul Hoque Abul Hasanat** for being a source of inspiration and for his constant support in the internship. The blessing, help and guidance and time given by him help me to go a long way in the journey of life.

I also take this opportunity to express my profound gratitude and deep regard to my instructor **Md. Nafis Tihami**, Associate Software Engineer,DSi for his exemplary guidance, monitoring and constant encouragement throughout this internship.

I am obliged to all my Training Team members, for the valuable information provided by them in their respective fields. I am grateful for their cooperation during the period of my internship. I'm thankful to them for their continual constructive criticism and invaluable suggestions and help, which benefited me a lot at my internship.

I am also thankful to those who are not mentioned but for their continual constructive criticism and invaluable suggestions and help, which benefited me a lot at my internship.

Executive Summary

This internship report highlights the author's experiences and contributions towards the DSI as an intern. It also represents the achievements and challenges during the internship program. The scope of this document is to identify and describe the analysis carried out, experience gained and focuses on the achievements as an intern.

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

Being a bachelor program student of IICT, the author was offered to take an internship at Dynamic Solution Innovators Ltd.(DSi), a well-known software company in Bangladesh. She has joined DSi as an intern. She was cordially welcomed by the DSi family. The author was treated as an employee and got all the facilities just like other employees. She has explored new technologies and practices, got familiar with industry people and faced new challenges. She feels really fortunate to have support and mentoring from her mentor and her training teammates.

After finishing a basic training phase the author was assigned to do some projects based on her trained knowledge. While Working on these projects, she has learned new technologies and the challenges during these projects helped her to be collaborative with other team members. The projects that the author worked on certainly helped her by increasing her practical knowledge in depth.

After the internship, the author is more confident, more skilled and more professional than she was before. Besides, there were some vital lessons which will help her in her future jobs.

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Chapter 1: Introduction

1.1 Preamble

Internship provides an opportunity for students to work at an organisation for a certain, minimal period of time to exercise their knowledge and get familiar with industry practices and cultures. It also helps students master professional soft skills such as communication, punctuality and time management. It delivers students a period of practical knowledge and experience in the industry based on their field of study. It plays a significant role to build up a communication bridge between academia and industry since industry discovers the capability of potential students. Experience and knowledge acquired through this internship program are beneficial to the student since it helps students encounter how their studies are applied and implemented in the real life project and work. As it provides real-life work experiences, it helps a candidate enrich her CV.

Institute of Information and Communication Technology (IICT) provides that glorious opportunity to their students of having an internship within their bachelor program. IICT always emphasises industry orientation in academic study. For this purpose, industry people are invited to IICT to talk about their companies and experiences. Often some technical courses are entirely conducted by them. The six months internship program is another, possibly most effective, way of achieving industry orientation.

The company I was sent for an internship at Dynamic Solution Innovators Ltd. It is one of the most renowned software companies in Bangladesh. The internship program helps to apply my knowledge in real life projects. I tried my level best to gain knowledge of the industrial culture and practices so that I may apply this gained knowledge and experience in my upcoming academic courses and career.

1.2 Objectives of the Report

The outcome of my internship is presented in this report and this report is prepared as a requirement of the internship program. It is prepared to deliver its readers information about the following objectives-

1.2.1 Broad Objective:

Theoretical knowledge can never fulfil the knowledge of developing software. The industry has to maintain a lot of things to reach software to root level users. These workings and thinking can only be achieved by working with them. The main objective is to represent my significant practical and cultural experiences achieved through the internship program at DSi.

1.2.2 Specific Objectives:

Besides the main or broad objective, the report has some specific objectives, which are given below:

- ➢ To represent the working environment of DSi.
- ➢ To highlight the core technologies and the software development process adopted by DSi.
- ➢ To describe the problems faced in developing a project.
- ➢ To describe how these problems are solved.
- ➢ To describe the software development cycle and models of DSi.
- ➢ To present the services provided by DSi to different other organisations and its clients.
- ➢ To describe the facilities and services provided by DSi to their employees and interns.

1.3 Scope

This report deals with my experiences and knowledge that I have earned through the internship program at DSi. It also provides a brief description of Dynamic Solution Innovators Ltd. It will also give a brief overview of DSi to the students of IICT who will continue the internship program at DSi in the future. It also will represent most of the major technologies used for developing software in Bangladesh. So, it will help new learners to avoid confusion about ongoing technologies in Bangladesh.

1.4 Methodology

The overall report is prepared by analysing my experience at DSi as an intern and collecting information from websites and documents provided by personnel of the company. Following are data collection-

1.4.1 Primary data

- ➢ Practical experience from real life project
- ➢ Direct inspection through the internship time
- ➢ Collaboration with team mates
- ➢ Seminars, monthly meetings
- ➢ Observing others jobs

1.4.2 Secondary data

- ➢ DSi official website
- ➢ Official document of different languages, tools and framworks
- ➢ Linked-In page of DSi
- ➢ Internet

1.5 Limitations

There are some limitations in this report. All the contents cannot be shared outside the office. As internal information of the company is highly confidential, so minimal information is provided by the office. I only describe in this report what I learnt from this company. So all the data given in this report may not be perfect. Moreover, gathering data and reviewing the report from office employees was also a tough job. It was quite hard to get time from them during the busy business hours.

Chapter 2: Company Profile

2.1 About Dynamic Solution Innovators Ltd. (DSi)

DSi is an international company founded in 2001 with clients in Asia, England, Finland and the United States. It has applied skills in web enabled e-commerce and ERP systems as well as wireless systems across a broad range of industries. It is a full service technology company and provides proficient, cost effective software development services throughout the world, both at their corporate development centres and at Client's premises. In addition, it provides competent management staff to assist the clients in all aspects of their mission critical projects.

DSi utilises on-site staff where required to enable a high degree of client interaction and project management. It is rock solid in its commitment to the clients. Their methodologies include advanced use-case and Two-phase Quality Assurance process. These allow for better technical and business requirements gathering, which in turn allow the company to deliver unique, innovative applications beyond customer's expectations. Depending on the software developed, they offer several levels of guarantees and system support and testing adds to their ability to deliver bug-free software.

The birth of DSi, Incorporated was to cut through the prevalent barriers to successful software development. There being a traditional disconnect in business and Information Technology (IT), DSi found that the developing process was flawed from the beginning, even from the business side of the company making the request for this development.

DSi is root oriented. According to the clients' opinion, they get to the root of the issue and fix it. DSi believes the IT portion of a "fix" does not go deep enough and keeps the client dependent on the fixer. DSi's "deep scan" of an issue not only gets to the origin of the problem, it leads the way into the business side of the fence to establish ways of anticipating opportunities, not just solving problems.

2.2 How DSi work

2.2.1 Team Augmentation

DSi first and foremost determines their clients' business goals and strategic requirements through scheduled sessions and thorough evaluation. A scalable and agile team is assembled and assigned from highly skilled dedicated software engineers who start working with maximum competency from day one. The team follows a unique delivery framework: consistent, predictable, and transparent. Any special subtleties can be covered in an NDA, and the customer retains complete IP rights.

2.2.2 End-To-End Development

DSi conducts thorough and detailed research and sets the roadmap towards a common goal. Their skillful design team helps visualise and prototype the project at a very early stage. They highly advocate industry proven Scrum development which allows them to ensure that the clients have full control over the process and will stay as long as their assistance is needed even after the project completion. DSi takes project ownership and responsibility for decisions that were taken during the development.

2.2.3 Consultancy

If anyone is looking for a mentor or a small team of experienced senior professionals who can provide consultancy and lead the team to the desired goal, DSi is very competent in this regard. In DSi, they have industry leading brains who are extremely adept at solving complex problems. Their seasoned professionals have extensive experience in solving problems regarding scalability or performance in large scale applications for the government or other IT companies. DSi has experts in various domains such as Software Architecture, Development Strategies and Scalability of software etc. They have already built multiple government level projects with highly scalable, distributed and fault tolerant architecture designed by their in-house experts. They also specialise in re-structuring and optimising for smooth scalability.

2.3 Services

2.3.1 UX Design

UX Design is concerned with how the users interact with an application. DSi provides simple, intuitive, and aesthetically pleasing UX/UI to its client. In DSi, they offer coherent user-centric solutions that deliver tangible business results by increasing customer utilisation. They are capable of designing international-standard solutions that blend industry-standard best practices with innovative ideas to design a unique solution and provide a seamless experience across the user journey, powered by intuitive design and robust backend integrations.

DSi’s UI/UX team composition boasts highly skilled and experienced architects, UX engineers, designers and even people with professional experience in photography. Their simplistic but highly useful solutions are specifically designed for a smooth user onboarding experience. They have helped clients boost the credibility of their solutions while maintaining high accessibility and usability standards.

2.3.2 Embedded System Design

DSi provides turnkey design verification testing using SystemVerilog and UVM that enables efficient test case development. They have in-depth expertise in the validation and verification testing of diverse systems for functional behaviour, compliance, performance and interoperability. DSi offers comprehensive UVM test benches with exhaustive verification environments composed of reusable components that can be used as part of an underlying methodology of constrained random, coverage-driven verification.

DSi prepares a comprehensive Verification Plan after thoroughly analysing the clients' requirements through intimate collaboration. Verification is only complete when every item on the plan has been tested to an acceptable level. Acceptable standards and the priorities assigned to testing the various features will be agreed upon in advance and are continually reviewed during the project.

2.3.3 Big Data & Data Science

DSi tackles big data challenges by leveraging emerging big data technologies and business intelligence tools to help clients extract actionable insights from diverse data sets generated in real-time and at a large scale. They are experienced with most BI Services including Tableau, AWS Quicksight, Yellowfin, and Jaspersoft and promote Cloud-Native & Data-First culture; hence concentrate on the platforms, tools, and people to enable clients to innovate around Big-data, Data-science, Cloud, and DevOps technologies. They have in-depth experience with nearly all AWS Data and ML services. DSi offers reliable processing for real-time data streaming by developing performant, fault-tolerant ETL pipelines for real-time events at scale. Their accomplished experts can orchestrate, automate, optimise, visualise data pipeline instances in a managed reproducible way.

2.3.4 Mobile Application Development

DSi has extensive experience in developing high-performing enterprise-class transformative mobile applications, leveraging next-gen technologies, intelligent algorithms, and modern UI. They offer a full cycle of application design, development, integration, and management services for both native Android and iOS platforms.

DSi performs an exhaustive requirement analysis that helps to coherently translate and streamline the business processes in a digital environment. They select the most appropriate architecture and a modern technology stack based on Kotlin for Android and Swift for iOS, as well as any specific components required for a project.

In 2019, DSi developed a sophisticated mobile app-based communication platform for SSF (Special Security Force) that boasts a highly secure communication protocol. They also have

experience in developing a national-scale PWA application that is capable of operating in low-power, low-bandwidth scenarios while maintaining enterprise-class security measures.

2.3.5 Cloud Services

DSi is highly experienced in developing high-value end-to-end big data environments, with machine learning and data-science technologies, particularly in AWS cloud infrastructure. Their full-scope services include efficiency audits, SLA management, and oversight of all critical elements of the client's cloud-based business to save time, budget, and resources.

DSi's cloud services provide app containerization services, abstracting operating system kernels so multiple cloud applications can perform consistently. They specialise in Docker containers, which facilitate cloud development processes, effortless remediation, and maximum scalability. Their engineers design innovative cloud strategies by helping the client choose the most relevant services from leading providers to support their business objectives. DSi has provided MLOps solutions to productionize ML models for different clients in cloud infrastructures.

2.3.6 DevOps Services

DSi's DevOps as a service offers intimate collaboration, monitoring, automation, and cloud adoption to achieve higher efficiency and better quality of software builds. They offer CI & CD along with a continuous delivery pipeline and take care of release management, continuous deployment, replica environment, new server setup, change management, and performance optimization on an ongoing basis.

DSi works with multiple tools as part of their DevOps practices to help with version control, testing, and automating build and deployment processing including Jenkins, Docker, Kubernetes, Ansible, and GitHub. They have integrated automated testing deep into the DevOps processes to reduce risk and deploy in a reliable manner. They also provide round-the-clock support for your mission-critical applications, monitoring all workloads across the cloud.

2.3.7 SQA (Software quality assurance)

SQA is an umbrella term that refers to a set of practices and processes that enable engineers to minimise uncertainties and maximise the predictability of the software lifecycle. Besides providing SQA support for the solutions DSi develops, they also provide Testing as a Service (TaaS) - conducting independent QA services for third-party apps and solutions. Through this service, they cover every aspect of quality assurance across from functionality to security.

DSi scrupulously follows STLC and industry-standard best practices like maintaining different versions of the Codebase(development version, QA version) on separate servers. Their exhaustive usability analysis identifies potential errors, confusing designs, and performance flaws as well as the most appropriate solution to resolve these issues. They also perform comprehensive security assessments to identify system vulnerabilities, provide critical recommendations, and ensure a highly secured system.

2.3.8 Database Management

DSi provides both on-premise and remote database management services for different types of databases. They manage and maintain patch and security updates, licence management and deployment for licensed databases like Oracle.

Their main strength lies with the open-source databases. DSi provides database migration services for companies that want to shift away from licensed databases and move to an open-source alternative. They specialise in open-source databases like MySQL, PostgreSQL, MariaDB, and other types of databases like MongoDB and RethinkDB. From design and configuration to monitoring, planning, automation, and more, their database consulting experts and certified DBAs, on-call 24/7, deliver exceptional technical competence and client responsiveness.

DSi database maintenance services include - real-time database monitoring and tracking; database replication; database up-gradation (major, minor, and edition upgrades) database optimization; patch management; data integrity check; elimination of possible corruption of data; data model maintenance; data Dictionary maintenance; reducing downtime; ensuring faster transactions speeds; improving indexing; risk mitigation; background configuration; and performance tuning among others.

2.3.9 Highly Scalable System Design

DSi offers a wide array of distinct offshore development services from simple coding to complex custom software development across a broad spectrum of industry verticals. With long experience in enterprise software development and successful long-running partnerships in global markets, DSi is a proven and trusted partner who can help materialise technology product ideas. Over the years, they have built a reputation of becoming a trusted offshore development centre for their clients, especially in the USA.

DSi offers expertise from concept to code, and development to deployment making sure the cost, time & quality of software development is optimised. One of their core competencies is

to be able to pace up with emerging technologies and utilise them to develop an innovative architecture that remains relevant for an extended period of time.

2.4 Projects

Top projects of DSi in terms of scale, complexity and impact:

2.4.1 ODMS (Off Dock Management System)

ODMS is an ERP solution with comprehensive 360 degrees operational, monitoring, control, and reporting support for the container and cargo management industry. ODMS has been operational since 2005, contributing to handling almost 40% of all container export and import operations of Bangladesh. ODMS is characterised by its design simplicity, execution speed, 24/7 service availability, and seamless adaptation of frequent enhancements. For 16 years, ODMS has retained its client's confidence and secured a position of prestige as an irreplaceable ERP in the industry.

Key Features:

- ➢ Complete container and cargo lifecycle management with 150+ reports and 500+ UI screens
- ➢ Transaction of large volumes of operational data (240K+ daily transactions)
- ➢ Activity & Operations Monitoring
- ➢ Smart location suggestions for optimum cargo and container storage
- ➢ Role-Based Dashboard
- ➢ Task wizard for task allocation and status management
- ➢ Dynamic one-click billing reconciliation
- ➢ Delivery of new billing business rules at a rapid pace
- ➢ Data exchange with external systems following industry-standard CODECO format

2.4.2 OpenCRVS (Open Civil Registration and Vital Statistics)

OpenCRVS is an open-source system supporting the digitisation of common processes for civil registration and vital statistics (CRVS). DSi has worked with Plan International as their development partner to create this open-source digital CRVS system that will work in every country and for every individual. OpenCRVS will be free and adaptable for different country contexts, designed with and for the people it serves. The software is intended to be easy to deploy and requires minimal skills for customisation, maintenance and support.

The OpenCRVS project aims to establish a countrywide citizen database for Bangladesh. The system stores citizen data in accordance with the Citizen Core Data Structure (CCDS). It has been integrated with DHIS2, a health information system that is used by all government hospitals in the country.

Key Features:

- ➢ Registration forms (for - birth, death, marriage, divorce, adoption and migration)
- ➢ Robust Record Searching Mechanism
- ➢ Approval Workflow of Submissions
- ➢ Generate Certificate for Collection
- ➢ Multiple Language Support

2.4.3 Olwel

Olwel is an integrated healthcare service delivery platform that combines a web application, an EHR (Electronic Health Record), a call centre, mobile applications, and an automated dispatch system based on geo-mapping to provide doorstep healthcare services for homebound patients.

Olwel is a Finland based startup company which is one of the fastest-growing Health IT startups in Bangladesh. DSi has been the developing partner of Olwel. Olwel application was developed with the aim to provide essential doorstep healthcare services for patients who prefer to receive medical consultation at the comfort of their home. It is an ideal solution for homebound patients and patients with disabilities. This innovative service platform connects qualified and trained general practitioners with patients so the service can be delivered directly to the patient's home. The Olwel application offers real-time coordination between a dispatched doctor, the patient, and the medical operator. There is a lot of data that flows between the doctor app, patient app, central server, and the medical operator console which needs to be processed in real-time.

Key Features:

- ➢ Facilitate appointments between the doctor and patients, both online and physical
- ➢ Provide online audio-video consultation between doctor and patient, through the two apps and the central server
- ➢ Connect the patient with the nearest doctor using geo-spatial mapping, for consultation at the patients home
- ➢ Coordinate the doctor visit to the patient home in minute detail in real-time, letting the medical operator observe the full process
- ➢ Act as an Electronic Health Record (EHR) for patients

2.4.4 Banking Compliance System

It is an online banking solution used by over 200 financial institutions including banks, credit unions, mortgage, and utility companies throughout the United States.

DSi has been working as an offshore development partner of a leading banking solutions provider in the United States since 2013. DSi has a dedicated team of over 40 software engineers working under this partnership to develop a versatile product suite including a comprehensive electronic document management system, advanced multi-channel marketing tools, and embedded payment solutions among various other modules. This is the trusted application of choice for more than 200 financial institutions for performing their regular day to day document management activities, starting from account holder statements to customised targeted marketing and generating useful insights from customer usage data. This highly secure solution complies with SOC2 and SOC3 standards and adheres to the strict regulatory requirements for digital document management of financial institutions in the US. The solution has been developed to ensure data security, availability, confidentiality, processing integrity and privacy—validating that the system is protected against unauthorised physical and logical access.

Key Features:

- ➢ Account Holder Statements
- ➢ Check Images
- ➢ Daily Notices
- ➢ Taxable Income/Interest Forms
- ➢ Customised Targeted Marketing
- ➢ Data Conversion and Digital Printing
- ➢ Electronic Presentment and Archival
- ➢ Reports on Customer Usage and Other Information
- ➢ Paper & electronic document management of notices, taxes, and loans
- ➢ Integrated statement portal
- ➢ Online document exchange for signature approvals
- ➢ Customizable approval workflow
- ➢ e-Payment services for online loan remittance

2.4.5 IPEMIS

Integrated Primary Educational Information Management System (IPEIMS) is a comprehensive education management system that aims to digitise the primary education sector of Bangladesh under the administration of the Directorate of Primary Education (DPE).

IPEIMS is being developed to revolutionise the country's primary education system. This national scale project will manage data of over 20 million students, 1,30,000 schools, and 3,50,000 teachers of the country. DSi aims to integrate the existing internal and external systems, revamp areas like textbook distribution, teachers training, census, and add features like remote learning and result collection. The system will aid DPE significantly to make timely and effective decisions for the primary education sector of Bangladesh. The IPEMIS project is being developed for the Directorate of Primary Education (DPE), funded by UNICEF and ADB.

Key Features:

- ➢ School module
- ➢ Teachers and Staff module
- ➢ Student module
- ➢ Census Survey module
- ➢ Book Distribution module
- ➢ Monitoring
- ➢ Teacher's Training module with LMS PECE Result Collection
- ➢ Remote learning module

2.4.6 Jenzabar

Jenzabar is a cloud-based enterprise solution for higher education management and is the trusted partner of choice to over 400 universities across 1,350 campuses worldwide, including ivy league, private liberal arts, state and community colleges, and business, medical, law and other prominent universities in the United States.

Jenzabar Higher Reach is an administrative platform for continuing education and workforce development that helps grow revenue, maximise enrollment, and optimise efficiency. DSi has been working as the software development partner of Jenzabar since 2013. DSi developed a wide range of modules for Jenzabar and integrated the Higher Reach database with Salesforce and Jenzabar Higher Reach CRM. The system provides a 360-degree view of student experience from recruitment to billing, to ensure student success. During pick time the system can support more than a million concurrent users.

Key Features:

- ➢ Student Enrollment
- ➢ Workflow Management
- ➢ Automated Scheduling
- ➢ Program Registration
- ➢ Payment Management
- ➢ Issuing Certificates
- ➢ Campaign Response Analysis
- ➢ Integration with 3rd Party Systems
- ➢ Course Creation and Management
- ➢ Auditing and Financial Reports

2.5 Tools and Frameworks

Over the years DSi has worked with many tools and technology. Some of those are given below.

Languages:

- ➢ C/C++
- ➢ Java
- ➢ Perl
- ➢ TypeScript
- ➢ Javascript
- ➢ HTML
- ➢ JQUERY
- ➢ PHP
- ➢ C#

Frameworks:

- ➢ JSF
- ➢ React
- ➢ Redux
- ➢ React Native
- ➢ Spring Boot
- ➢ Laravel
- ➢ Play
- ➢ Struts
- ➢ Angular JS
- ➢ Hibernate

Databases:

- ➢ MongoDB
- ➢ MySQL Server
- ➢ Oracle
- ➢ PostgreSql
- ➢ MariaDB
- ➢ RethinkDB

Servers:

- ➢ Tomcat
- ➢ JBoss

Cloud:

- ➢ Amazon Web Service(AWS)
- ➢ Windows Azure

Microservice:

- ➢ Docker
- ➢ Kubernetes
- ➢ Jenkins
- ➢ Ansible

2.6 Location and Physical Layout

The USA Office of DSi is located at 8201 164th Ave NE, Suite 200, Redmond WA 98052, United States Of America.

The location of the Bangladesh Office is House 177, Lane 2, New DOHS Mohakhali, Dhaka 1206, Bangladesh. There are also 3 other floors for DSi in separate buildings. Two of them are on the same road as the main office at Lane 2 and the remaining one is at Lane 4 but very close to the main office.

The main office is a three-storey building. The floors as well as the other floors are well furnished with modern interiors and kitchens for tea and coffee breaks. The 3rd floor of the main office contains the main kitchen and a well furnished dining where lunch is served.

The floor on Lane 4 also includes a recreation corner with video games and a TV. The dining also includes a TV.

2.7 Human Resources

DSi has about 200 permanent employees at this moment including the office chef. It has grown in number of resources and production every year. DSi is always recruiting new developers as it is looking forward to expanding more. The company has its separate UI/UX design team. Every team for different projects also includes QA engineers. They have also started internship programs in 2021 in order to enhance DSi further.

2.8 Facilities for Employees

Man power is one of the most important resources of any organisation. Performance and success of an organisation depends on the employee of the company. Therefore providing all basic facilities for modern human beings is very important. According to the two-factor theory of job satisfaction, salary is just a hygiene factor. Motivation factors are important for high productivity. DSi provides various facilities to their employees. This encourages them to work more properly.

2.8.1 Festival Bonus

Employees are granted a bonus twice a year to celebrate Eid-ul-Fitr and Eid-ul-Adha.

2.8.2 Marriage Bonus

If an employee of DSi marries, he or she gets a good amount of bonus for their marriage as congratulations.

2.8.3 All Day Free Food

All day free food is available here. Buffet lunch is served and lunch is cooked in DSi's own kitchen which is fresh and healthy. There is also daily surprise food in the evening. Coffee and tea are served all day. Special events are also celebrated with food such as birthdays celebrated with cakes, pizzas etc.

2.8.4 Yearly Increment

DSi gives its employees yearly increments on their salaries. Also, there is a system of percentage reward for when a job is specially done well.

2.8.5 Flexible Working Hour

DSi has 8 hours and 5 days in a week working schedule. In DSi generally the hours between 10.00AM to 6.00PM are considered as working hours. But the company provides a flexible

working hour for its employees. If you start your office at 11.00AM and work 8 hours until 7.00 PM, it is still Okay. Anyone can come or leave the office before or after schedule time.

2.8.6 Indoor Games

There are facilities for employees to take a break and play indoor games such as chess or video games such as Fifa etc.

2.8.7 Recreation

DSi has different ways for recreation of employees. There are yearly 6 team dinners planned for each team in renowned restaurants. Every year, DSi arranges for an annual tour for its employees where they can also bring their families.

2.8.8 Paid Maternity Leave

There are facilities for paid maternity leaves for new mothers. DSi cultivates a stress free healthy environment for their employees.

2.8.9 Cosy Environment

Providing a healthy and friendly environment in addition to a professional setup is very important. DSi believes that in the journey employees should stay fit both physically and mentally while absolutely loving what they do. Hence, it provides all the facilities that are needed for refreshment of the employees while doing their creative jobs. There are facilities to rest for a bit and take a short nap for the employees if they are feeling very tired to replenish their energy.

2.9 Culture

- ➢ There are indoor game competitions arranged within the company. DSi also participates in the Inter software cricket tournament.
- ➢ DSi presents new employees with gifts upon joining.
- ➢ If an employee becomes a parent, they are presented with gifts as congratulations.
- ➢ The DSi family always attends the marriage ceremony of their employees. A grand gift is arranged for the married couple by participation of all DSi employees.
- ➢ All the members take part to buy gifts and throw parties to say goodbye and wish well to any employee leaving the company.

- All the employees are always connected with each other and share a special bond among them. whether it's through doing research and development, sometimes having errors in code, sometimes discovering new solutions to problems etc. They feed off of each others' passion and energy.
- An online meeting is held on every last Thursday of every month with the CEO from the Canadian office. Every employee of the company including the CTO participates here and ongoing projects, future plans etc. are discussed.

Chapter 3: Project Work

3.1 Overview

Internship is a process of making a newcomer familiar with his own job field and adapting him with the actual industry-oriented task that will help him in future to gain a successful career. We have completed different courses in our academic life based on different technologies such as object oriented programing, web technology, software testing, analysis and design. We have just learned the academic practice and concepts but how to apply this knowledge with actual industry practice is unknown because we don't have experience. As internship is a part of our academic curriculum it plays an important role in the learning and schooling phase of a student.

The internship at DSi is mainly and basically a training phase. Though we had no prior knowledge about internship, our mentor helped us to overcome this situation. We were given sessions and tutorials on various different concepts. Then we were given assignments to work on our own. The ultimate goal of the internship here at DSi is to deeply understand and learn these various different concepts.

3.2 Individual project

First of all, a session was arranged for the interns. Our mentor took the session on JavaScript and React and we were given various projects to do.The assignments were submitted through Basecamp app where the main supervisor of the whole internship program, CTO of DSi, Mojahedul Hoque Abul Hasanat could also access them. We were always suggested various tutorials so that we could learn the concepts clearly and also complete the assignments easily.

The individual projects that I worked on are described briefly below:

3.2.1 Self-Resume

The first assignment of our internship was to build a self resume from scratch with raw HTML and CSS. I completed the work within the given timeframe.

Major Learning Focus

- ➢ HTML
- ➢ CSS

3.2.2 TODO App

It was a simple CRUD web application. It was the 1st assignment on React and JavaScript. We can create todo here and the list will be shown. We can also edit or delete the todo if wanted. There were no backend tools used here.

Technologies used:

- ➢ CSS
- ➢ JavaScript
- ➢ React
- ➢ GitHub

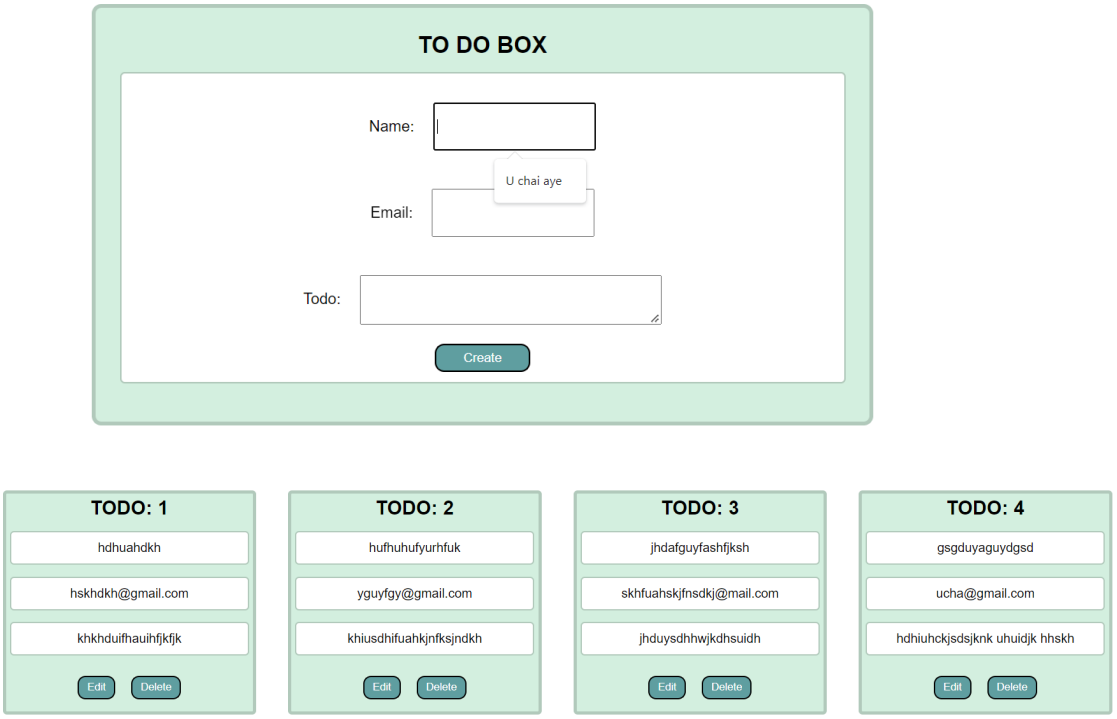

Figure 1: CRUD (ToDo App)

3.2.3 E-Commerce website with Fake API

In this assignment, there was an online shopping app where we could add products to cart that we wanted to buy. The cart will show the products added along with the total price. If wanted we could delete any product from the cart or increase and decrease the quantity of a product. Here we used a fake API for product data. The main objective of the assignment was to give us an idea about Redux and teach us how to work with API.

Technologies used:

- ➢ JavaScript
- ➢ React
- ➢ Redux
- ➢ Tailwind CSS
- ➢ Git and GitHub

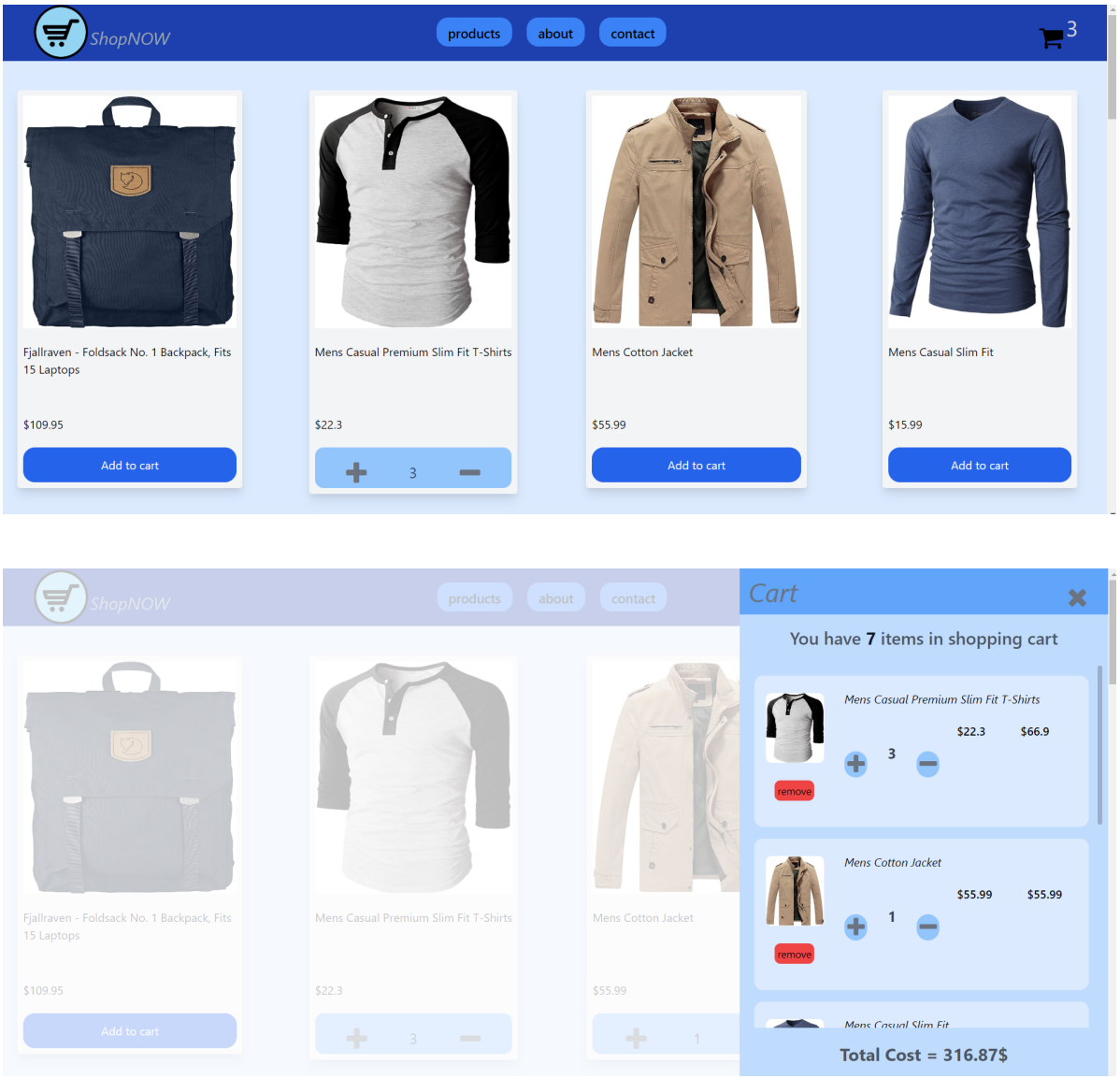

Figure 2: E-commerce website

3.2 Team project

The next phase after individual assignments were team projects. All the employees who were in the training phase including newly joined junior Software Engineers were divided into 2 teams. One was the 'Java' team and the other was the 'JavaScript' team. I was in the JavaScript team. In this team, there were a total of 3 interns including me and 2 newly joined Jr. Software Engineers. Then we were given team projects which are described briefly below:

3.2.1 Classroom app

It was our 1st team project. The main objective of the classroom app project was to instruct us on how to work in a team and give us an idea about backend.

Features of this app:

- ➢ User login system as Teacher or Student
- ➢ Role (Teacher or Student) based authentication
- ➢ Different frontend view for teachers and students
- ➢ Teachers can add a new student and also can add a new teacher
- ➢ Students can view posts and add comments on a posts
- ➢ A teacher can edit and delete his/her own posts only
- ➢ Teachers can view teacher list, student list and all posts with comment
- ➢ Students can delete their own comment
- ➢ Teachers can remove any student from the classroom

Technologies used:

- ➢ JavaScript
- ➢ React
- ➢ Redux
- ➢ Tailwind CSS
- ➢ Hapi js
- ➢ GraphQL
- ➢ MongoDB
- ➢ Git and GitHub

3.2.2 E-Commerce website with Backend

Enhancing the E-commerce app we created earlier in our training phase, was the 2nd team project. We were to enhance it and build it with a backend. The main objective of the assignment was to give us a complete grasp of the tools used in the process.

Features of this app:

- ➢ User login system as Shop-owner or Customer
- ➢ Role (Shop-owner or Customer) based authentication
- ➢ Different frontend view for Shop-owner and Customer
- ➢ Shop-owner can add product including product price to his shop
- ➢ Customer can collect products as preference in cart and check out
- ➢ Shop-owner can edit and delete his shops product

Technologies used:

- ➢ Back-end: GraphQL, MongoDB
- ➢ Front-end: JavaScript, React, Redux, Tailwind CSS
- ➢ Framework: Hapi js
- ➢ Git and GitHub

3.3 Google sheet project

After the completion of team projects, I was told to study on Google sheet and appScript. I was given appropriate time for it as it was a new technology for me. My instructor for this project, Md Nafis Tihami, helped me to learn this new tech easily by giving small tasks to complete.

3.3.1 FIFA Game (online) Score Count

When we enter the names of whoever will play the FIFA game, google sheet will randomly create teams. It can be easily told who will win the game in the end by counting the scores. The main objective of this task was to create teams easily and select the winner with just a click.

Technologies used: Google Sheet and AppScript

3.3.2 Project Cost Count

The main task is to count the cost of projects of the company without giving access to the employee salary sheet to HR. Only the CTO and the cashier have access to the employee salary sheet.
A sheet containing the details of the working percentage of employees on different projects which was created by the HR and had access to both CTO and cashier too.
HR has to calculate the cost of each project of the company for which employee salary from salary sheet and employee working percentage from percentage sheet is needed. Since HR has no access to the employee salary sheet , it was impossible for HR to count all project costs. Here my task was to help HR to count the project cost easily. Then another task I had to do was to count project costs between some specific time intervals (i.e 2020, March to 2021, May). In doing this task I had to study the Firebase database also.
Another way to complete this task where the cashier has to count all project costs and HR is not required to have access to the salary sheet, which is the easier way compared to the first one.

Technologies used: Google Sheet and AppScript

Chapter 4: Acquired Knowledge

4.1 Overview

An internship is the first opportunity to apply the skills and knowledge that I have learned from the classroom to the real life field. Without the real-world experience, a person is incapable of knowing how to translate theory into practice. Employers prefer candidates, who have experience, because it takes time to become accustomed to a professional role. It is crucial for me that I use my internship experience to have career-related skills. The experience gained from the internship has given me a head start in this regard. This experience of my internship will help me to get step forward in my career.

In this section, I will discuss technical and non-technical knowledge that I acquired through the internship.

4.2 Technical Skills

This internship has provided me with a wonderful opportunity to acquire various technological skills. Though it may take some more time to master those skills, at this moment I am confident to apply them in any of my projects. Some of the significant technical aspects that I have handled during the internship are listed below.

4.2.1 JavaScript

JavaScript (often shortened to JS) is a dynamic programming language. It is also known as ECMAScript and is widely used for controlling web page behaviour. It runs on the client side of the web browser, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously and alter the document content that is displayed. It is also used in server-side network programming with runtime environments such as Node.js, game development and the creation of desktop and mobile applications.

4.2.2 React

React is a declarative, efficient and flexible JavaScript library for building user interfaces. It composes complex UIs from small and isolated pieces of code called “components”. It is used for handling the view layer and can be used for web and mobile apps development. It allows the reuse of existing code to develop new features. It also allows developers to interface with other libraries and frameworks.

4.2.3 Redux

Redux is an open-source JavaScript library used to manage application state. React uses it for building the user interface. It allows React components to read data from a Redux Store and dispatch Actions to the Store to update data. It is the official UI bindings for React Application. It is kept up-to-date with any API changes to ensure that React components behave as expected. It implements many performance optimizations internally, which allows components to re-render only when it actually needs.

4.2.4 GraphQL

GraphQL is a query language for APIs and a runtime for fulfilling those queries with existing data. It provides a complete and understandable description of the data in the API. It gives clients the power to ask for exactly what they need and nothing more. It makes it easier to evolve APIs over time and enables powerful developer tools.

Its queries access not just the properties of one resource but also smoothly follow references between them. While Typical REST APIs require loading from multiple URLs, GraphQL APIs get all data in a single request. Apps using GraphQL can be quick even on slow mobile network connection. Its APIs are organised in terms of types and fields, not endpoints. It accesses the full capabilities of data from a single endpoint. It uses types to avoid manual parsing code.

It support several languages (JavaScript, Go, PHP, Java / Kotlin, C# / .NET, Python, Rust, Ruby, Elixir, Scala, Flutter, Clojure, Haskell, C / C++, Elm, OCaml / Reason, Erlang, Perl).

4.2.5 HapiJS

Hapi.js is derived from Http-API. It is an open-source Node.js framework used to build powerful and scalable web applications. It is commonly used to build Application Programming Interface servers, HTTP-proxy applications and websites. It was originally built using the express framework before facing challenges that drive walmart to make hapi, its own stand-alone framework.

4.2.6 MongoDB

MongoDB is a document oriented NoSQL database used for high volume data storage. Instead of using tables and rows as in traditional relational databases, it uses collections and documents. Here documents consist of key-value pairs, which are the basic unit of data.

4.2.7 Tailwind CSS

Tailwind CSS is basically a utility-first CSS framework for rapidly building custom user interfaces. It is a highly customizable, low-level CSS framework that gives all of the building blocks needed to build bespoke designs without any annoying opinionated styles that have to fight to override.

4.2.8 Git and GitHub

Git is an extremely popular version control system that is at the heart of a wide variety of high-profile projects. Git is installed and maintained on the local system (rather than in the cloud) and gives a self-contained record of ongoing programming versions. It can be used completely exclusively for any cloud-hosting service.

GitHub offers a cloud-based Git repository hosting service. Essentially, it makes it a lot easier for individuals and teams to use Git for version control and collaboration. It's interface is user-friendly enough so even novice coders can take advantage of Git. Without GitHub, using Git generally requires a bit more technical savvy and use of the command line.

4.2.9 Google Apps Script

Google Apps Script is a cloud-based JavaScript platform that lets us integrate with and automate tasks across Google products. It is a rapid application development platform that makes it fast and easy to create business applications that integrate with Google Workspace applications like Gmail, Calendar, Drive, Sheet and more.

It is versatile. We can do several things with it like,

- ➢ Add custom menus, dialogs, and sidebars to Google Docs, Sheets, and Forms.
- ➢ Write custom functions and macros for Google Sheets.
- ➢ Publish web apps — either standalone or embedded in Google Sites.
- ➢ Interact with other Google services, including AdSense, Analytics, Calendar, Drive, Gmail, and Maps.
- ➢ Build add-ons and publish them to the Google Workspace Marketplace.

At the time of my internship, I used this tech in my Google sheet project. It is really simple and easy to learn as I have knowledge about JavaScript in advance.

4.2.10 Google Sheet

Google Sheets is a spreadsheet program included as part of the free, web-based Google Docs Editors suite offered by Google. The service also includes: Google Docs, Google Slides, Google Drawings, Google Forms, Google Sites and Google Keep. Google Sheets is available as a web application, mobile app for: Android, iOS, Microsoft Windows, BlackBerry OS and as a desktop application on Google's Chrome OS. The app is compatible with Microsoft Excel file formats. The app allows users to create and edit files online while collaborating with other users in real-time. Edits are tracked by users with a revision history presenting changes. An editor's position is highlighted with an editor-specific colour and cursor and a permissions system regulates what users can do.

It establishes a ground truth for data in online spreadsheets, with easy sharing and real-time editing. We can use comments and assign action items to keep analysis flowing.

4.3 Non-technical Skills

Although technical learning is important, professional learning is the sole purpose of an internship. DSi has been an excellent place to work and learn simultaneously.

4.3.1 Attitude

As an intern, I always try to maintain the positive attitudes to represent myself along with my institute. I am accustomed to concentrate on my assigned work. I refine myself from doing anything that may cause any reputation issues for me and my institute. I always remain friendly not only with my teammates but also with other people. I give such effort to express my dedication for work and try to contribute to the company through this effort

4.3.2 Punctuality

Punctuality is an important factor in professional life. In DSi, we had to attend office premises and give our attendance within a certain time. Every single work in the office premises happened in a very timely order.

4.3.3 Knowledge Sharing

In DSi, I could ask my mentors about anything at any time. They are always keen to our interests and help us provide proper direction. They always encourage us to discuss the things we want to know and show us that if we discuss and share more we can actually learn more. Also, various sessions are conducted both in office and online where team people share something new they’ve learned about.

4.3.4 Professionalism

Professionalism is the conduct, behaviour and attitude of someone in a work or business environment. The environment in universities and software farms is quite different. In DSi, people are quite smart. Everyone I worked with was really friendly and professional. These types of attitudes always persuade me to be aware of what I am doing and encourage me to learn more about the things. This also helps me to change my perspective and teaches me that there is always more to learn and more to know.

4.3.5 Communication

Communication skill is very important to succeed in a professional environment. Internships provide the best chance of improving students' communication skills. At DSi, I have worked with many people. I have learned how to approach and seek help from anyone. Besides, recreational sessions, employee welcoming parties, farewells helped me to know and communicate with many people.

4.3.6 Responsibility

Each task in DSi helped me to realise the responsibility of this kind of work. What I have done, may have a good impact on other people. I have learned how to maintain the code quality, the conventions and rules, so that my contribution to the projects has a good remark.

4.4 Overall Analysis

I tried to perform as a worthy student of IICT in this internship period. I have gathered lots of experience. I had lots of responsibilities and successfully completed them. I always tried to be unique in performance. I think that I progressed a lot and this progress made me confident and will help me in my future life.

Chapter 5: Conclusion

5.1 Conclusion

Getting an opportunity to work in DSi is probably one of the best experiences in my academic and career life. It helped me to shape my thoughts and perspective in various ways. I have been able to learn a lot not only from the company itself, but also some people with a great mindset. This pleasant experience will help me to be confident enough about myself and take a healthy mindset in the future career.

The working environment of DSi is truly wonderful. Everyone is really friendly and helpful. The cooperation among the employees was really amazing. Also, everyone was really professional about their work here.

Finally, I want to thank everyone affiliated with this internship program and I hope this experience will help me greatly in future.

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