

Date: 14th July 2022

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 Md. Noor Uddin, Institute of Information and Communication Technology, Shahjalal University of Science and Technology.

I wish him all the best and hope that he will lead a successful career.

For Leads Corporation Ltd.

Md. Nur Hossain

Manager, Banking Solutions

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Shahjalal University of Science and Technology

SWE 420

Internship Report

Submitted By: Md. Noor Uddin Performed at: LEADS Corporation Limited

LEADS

 $Registration\ No: 2017831027$

Department Of SWE

IICT, SUST

Date of Submission: July 16, 2022

Letter of Transmittal

Date: July 16, 2022

Prof M. Jahirul Islam

Director

Institute of Information and Communication Technology

Shahjalal University of Science and Technology

Subject: Letter of Transmittal

Dear Sir,

I am pleased to submit the Internship Report that you have asked for. I have been working as an Intern at 'LEADS Corporation Limited .' on 4/1 semester as a part of our course, SWE 420.

This report contains my experience in the company. It is my immense pleasure in presenting you this report based on my observation and experience during my internship period, starting from September 1st,2021 to February 28th, 2022. During this period, I worked under the supervision of Md. Nur Hossain, Manager, Mosa. Salma Sultana, Software Architect and Shafiqur Rahman, Senior Software engineer at Leads Corporation Limited.

I believe this report will be quite interesting and fulfill 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,

Md. Noor Uddin
Reg Number: 2017831027
SWE, 4th Year, 1st Semester
Institute of Information and Communication Technology
Shahjalal University of Science and Technology

Acknowledgment

First of all, I would like to thank my Institute, Institute of Information and Communication Technology, SUST for arranging the internship program for me. I am also grateful to LEADS Corporation Limited for recruiting me as an intern.

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

I take this opportunity to express my profound gratitude to my Team Leader Md. Nur Hossain, Manager, Mosa. Salma Sultana, Software Architect and Shafiqur Rahman, Senior Software engineer for their exemplary guidance, monitoring, and constant encouragement throughout this internship. The blessing, help, and guidance given by them from time to time shall carry me a long way in the journey of life on which I am about to embark.

I am obliged to all my 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.

Executive Summary

The internship report highlights the major works carried out by the author in terms of academic and non-academic perspectives. The scope of this document is to identify and describe the analysis carried out, projects completed, experience gained, and focuses on the achievements as an intern.

The author was sent to Leads Corporation Limited to complete his internship. The author found himself rather lucky by getting the chance to work in such an environment that the organization provided and got introduced to some of the new terms, new Technologies, and new Languages. But the most amazing experience was to work in a multicultural work environment.

The projects that the author worked in certainly helped him by increasing his practical knowledge depth. The development projects were particularly helpful in widening his views regarding different web application development frameworks and mobile application frameworks.

Keeping the coding apart, there were also a few more challenges. Some of them were technical and some were non-technical. Coming almost at the end of his internship, the author discovered that some of his communicative and management skills have been improved to a great extent. Besides, there were some vital lessons which will help him in his future jobs.

After the internship, the author is more confident, more skilled, and more professional than he was before.

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Chapter 1

1.1 Introduction

Internship is the process of on-the-job training, which is particularly beneficial for students with majors in technical courses.

Institute of Information and Communication Technology (IICT) provides that glorious opportunity to their students of having an internship within their bachelor program.

IICT always emphasizes 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.

Internship helps the students to link-up their academic experience with industry practices. I have tried my best to combine both. I hope I'm successful. The future semesters of my degree will prove the fact of success and failure.

The company I was sent for an internship is Leads Corporation Limited. It is one of the leading software companies in Bangladesh.

1.2 Objective

This report has been prepared as a requirement of the internship program provided by the Institute of Information and Communication Technology (IICT), SUST. The report is intended to reflect my achievements, project involvements, professional growth, and industrial experiences during the intern period.

1.3 Scope

This report gives an insight into the experience that I faced in my workplace at Leads Corporation Limited. It also provides a brief description of Leads Corporation Limited for students who are interested in the organization for their professional growth. This report will also give a brief overview of the organization to the students of IICT who will continue the internship program at the organization 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 Limitations

There are some limitations in this report. All the contents cannot be shared outside the office. I only describe in this report what I learnt from this company and what feedbacks I got from my team members and co-workers, so all the data given in this report may not be perfect.

Chapter 2: Company Profile

2.1 About LEADS Corporation Limited

LEADS Corporation Limited has been a foremost information technology service provider since 1992.

LEADS is involved in designing, developing, implementing and maintaining business application software for both domestic and overseas markets. LEADS provides Core Banking Solution (BankUltimus) for the Banking industry for both local and global markets. In addition to the banking industry LEADS provides products, services and solutions for non-banking financial companies, agent banking, capital market, broker house, life insurance, enterprise resource planning (ERP) etc.

Furthermore, LEADS provides complete life cycle of software development services including system analysis, use case development, system architecture & design, system integration, native, web API development, UI/UX design, database design and administration, functional and system testing, quality assurance and project management. Apart from the above-mentioned services LEADS also provides diversified IT solutions and services that support attainment of client's business objectives like building network infrastructure, plastic card personalization, delivery & installation of PCs, Servers, storage and backup solutions, POS, and ATMs etc.

Over the last couple of years, LEADS has also moved into disruptive technologies like BLOCKCHAIN, Internet of Things (IoT), Artificial Intelligence (AI) etc. Today LEADS is considered as one of the renowned ICT Solution Providers of Bangladesh and has become an IT partner of choice for managing people, process and environment. Continuous thrust for improving quality is the reason behind its success.

2.2 Company Type

LEADS Corporation Limited has been a foremost information technology service provider since 1992 when it became the exclusive distributor for Bangladesh of the global giant NCR Corporation, and took over the support service of NCR's then Bangladeshi customers.

2.3 Location and Physical Layout

Corporate Head Office : Leads Tower, Plot#1, M-20, M-13, Main Road 1, Section 14, Mirpur, Dhaka, Bangladesh.

Dhaka Branch Office: 9th Floor, Rupayan Trade Center, Banglamotors, Dhaka, Bangladesh.

Rajshahi Branch Office : 250/10, Block B, Dhanshiri Residential Area, Sopura, Rajshahi, Bangladesh.

USA Office: 2420 Bronze CT, GA 30041, USA

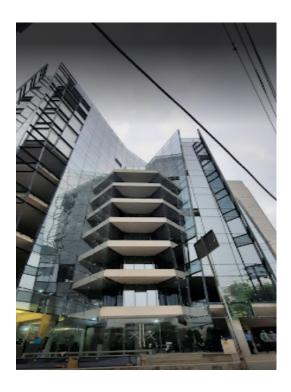


Fig 2.1: Office Building of Leads Corporation Limited

2.4 Human Resources

Leads has more than 250 permanent employees at this moment and they are planning to recruit more as they have more plans to produce quality products. Since the beginning, Leads has grown in the number of resources and production every year.

Leads runs training and review sessions to keep it on the top. And the culture of constructive criticism, learning, and sharing expands the organization's horizons and keeps it level headed.

2.5 LEADS Products

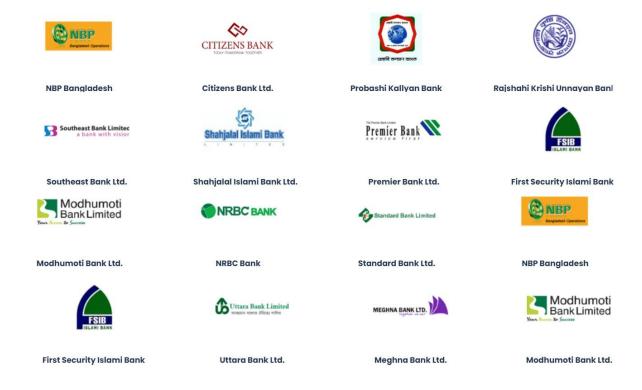
Over the year's Leads provided many products to software industry, few of the them are mentioned below:

Featured Products:

- bankUltimus
- VerifID
- CenterPoint
- LEADSVAT
- InsurSoft
- LIA
- CAPITA
- RecruitGenie
- And many more..

2.6 Leads Customer And Partners

Customer:



Partners:



2.7 Tools and Frameworks

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

Languages:

- 1. C#
- 2. Java
- 3. JavaScript
- 4. YML
- 5. JSON
- 6. HTML
- 7.CSS/SCSS/SAS
- 8.JQUERY

Frameworks:

1. ASP.NET Core 2.

Windows Forms

3. Windows Presentation Foundation 4.

LINQ

5. ASP.NET Entity Framework 6.

ASP.NET MVC

Databases:

- 1. Oracle
- 2. MSSQL Server

Servers: IIS

Cloud:

- 1. Amazon AWS
- 3. Windows Azure

Microservice: Docker

2.8 Facilities for Employees

According to the two-factor theory of job satisfaction, salary is just a hygiene factor. Motivation factors are important for high productivity. Leads provides several facilities for the employees which helps the employees to calm their minds.

2.9 Office Schedule And Methodology

The office starts at 9:00 am and ends at 6:00 pm, from Sunday to Thursday. There is a 1:00 hour break for lunch and prayers.

Leads follow **Agile Methodology - Scrum Process**. Each Month is considered as a sprint and all the plans or tasks are prepared and distributed among the team at the beginning of the month.

On working days at 9:15 am a scrum meeting is conducted in which we answered three questions -

- What did we do yesterday?
- What difficulties did we face during those tasks?
- What is my plan for today?

There were backlog grooming sessions, which revolves around what tasks/plans to take up next month and knowledge sharing sessions.

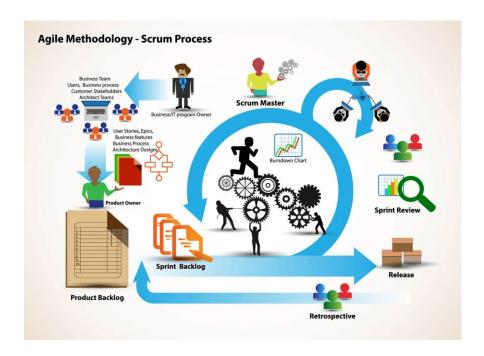


Fig : Agile methodology - scrum process.

2.10 Culture

Leads has a great working environment with a rich culture of fun and professionalism that attracts the best talents. Cultures that I have found in Leads Software are discussed below:

2.10.1 People

Leads doesn't hire developers, designers, or QA engineers, it hires people who can solve problems and show promising qualities. It runs training and review sessions to keep employees on the top. And its culture of constructive criticism, learning, and sharing expands our horizons and keeps employee level headed.

2.10.2 Culture of fun and creativity

Leads believe in the simple principle that creative work requires a special kind of work culture. The organization is very careful to maintain a culture that helps attract talented people and helps them achieve their best performance. This culture starts from workplace structure to operating principles of the development teams. Leads have been very careful to create an environment that actively enhances the knowledge exchange and collaborative nature of our work.

2.10.3 Culture of fun and passion

There is no doubt that there is something wrong with Leads - but in a good way. Employees are always obsessed with something. Which ensures their way to meet their goals.

Chapter 3: My Internship Activities

3.1 Project Overview

Core Banking Solution (CBS) branded as "BankUltimus" provides integrated solutions for Retail, SME and Corporate banking as well as features supporting Trade Finance, Loan management system and many more. It is an enterprise banking solution that enables Banks to provide a full range of banking services and content to Customer Information File (CIF), Know Your Customer (KYC) & Transaction Profile (TP) according to Central Bank compliance efficiently and reliably.

Features -

- End to end Integrated
- Customizable and User Friendly
- Support All Delivery Channels
- Conventional, Islamic, Off-shore
- Banking, NBFI
- Central Database, Robust Security
- Open Platform, n-tier architecture
- Web based system
- Extensive Parameterized

3.2 Team

We were a team of 11 members including 3 interns under BankUltimus.We worked on the project called **UltimusNex** and were under supervision of Md. Nur Hossein, Manager, Leads.

We all were assigned to the same project. We worked on both-ends, that is front-end and back-end, developing API's, UI's and performing functionality tests, unit tests. We also carried out the role of code reviewer where we tested the API's and UI's developed by other team members.

3.3 Learning And Working Periods

As Leads consider each month as one sprint and plans at the beginning what to do accordingly within that month, my six months internship journey is also divided into six periods. Those are stated below -

1st Month: Diving into Technologies

" Learning different programming language and tools & technology like VueJS, CSS, HTML, JQuery, Java Script, WebAPI, ASP.Net Core 3.1, Entity Framework, Dapper ORM, LINQ, Oracle SQL, Visual Studio 19, VS Code and GitHub ".

This instruction was from my Team Lead and I received one month to grasp the concepts and gain sufficient knowledge over the stated technologies.

Challenges: As someone completely new to these technologies I have had my fair share of difficulties while learning those within a stated time period. But i was able to overcome those difficulties following the instructions of my supervisors who i am thankful to.

2nd Month: Understand Organization Convention And Test Project

- 1. Understanding Web Application software development concept, UltimusNex Solution architecture for UI level development and Coding conventions.
- 2. Understanding Web API development concept and UltimusNex Solution architecture for API level.
- 3. Complete test project within a pre-defined time frame under guidance of a senior team member.

My second month's instructions summary from my Team Lead.

After spending the first month Learning and going through the technologies stated by my Team Lead, the Second Month is where I was told to Develop, Modify and fix the bugs of a Project Named as "Test Project" to judge my gained knowledge.

This test project consisted of developing **Three Web Pages**,**Three API's** and to connect the front-end with back-end inorder to make it functionable.

Also, one other purpose of the Test project under supervision of senior's was to enhance us regarding organization convention and befitting for both front-end and back-end roles which we would act on later.

Challenges: Developing a Test project which maintains organization standards without having proper industry level knowledge comes with difficulty which required constant asking questions from my seniors. Also, While developing the Test project there were few issues which I was able to solve because of the guidance from my supervisor.

As someone who keeps mostly to himself, I had to break the barrier and come out of my shell and reach out to them for required help.

3rd Month: Working On Main Project With The Team

- 1. Understanding ASP.Net Web Forms, ASP.Net MVC, WCF Service, Oracle PL/SQL (Basic Level)
- 2. Understanding BankUltimus SPARK solution architecture, coding conventions and purpose and operations of parameter pages.
- 3. Perform assigned UI level development tasks to migrate parameter pages from BankUltimus SPARK to UltimusNex within a pre-defined time frame under guidance of a senior team member.
- 4. Perform unit test operation for each function to ensure expected result.

These were instructions of Third month from my Team Lead.

After successful implementation of the Test Project which was reviewed by my Supervisor's and because of their approval, I went on to join the team. During the month,

- I developed a number of Web Pages and API's.
- Completing a Task of a single Web Page required Coding and Designing the page, Connecting it to API and then performing tests to check page functionality.
- Completing a Task of single API required coding and unit testing through Swagger and/or Postman.

Challenges: Development process is not without errors and bug fixations. Quite a few errors and bugs kept me busy for a good amount of time. But solving them also gave me knowledge which I didn't possess earlier. Also As we went back to home office, there were difficulties like vpn problems which disconnected us from the office computer. Also communication was not so smooth as in comparison to a physical office.

4th Month: Working Further With the Team and Becoming Code Reviewer

- 1. Perform assigned API Level development tasks to migrate parameter pages from BankUltimus SPARK to UltimusNex within a pre-defined time frame under guidance of a senior team member.
- 2. Perform unit test operation for each function to ensure expected result.

Fourth Month instructions from my Team Lead. This month followed as it's previous month where I have developed a number of Web Pages and API's for the organization working with the main team.

During this month I also played the role of "Code Reviewer" which included

- Review Codes and check for code smell, Bugs and proper functionality implementation in Web Pages.
- Test API's in swagger, postman

Challenges: Error's and Bugs and Fixations of these were challenging because as time went, tasks became a bit more advanced.

5th Month: Followed as previous, Also Modifying Previously Developed Bugged Pages of Others

- 1. Perform assigned UI level development tasks to migrate parameter, deposit & GL pages from BankUltimus SPARK to UltimusNex within a pre-defined time frame under guidance of a senior team member.
- 2. Perform unit test operation for each function to ensure expected result.

Fifth Month instructions from my Team Lead.

In this month also, I have developed a number of Web Pages and API's and reviewed a few web pages and API's for the organization working with the main team.

In addition to that, I was tasked with some previously developed bugged pages for fixations and preparing them for delivery.

Challenges: Challenges remained the same as previous month. Error and bus fixations while developing the tasks.

6th Month: Followed as previous

- 2. Perform assigned UI level development tasks to migrate parameter, deposit & GL pages from BankUltimus SPARK to UltimusNex within a pre-defined time frame under guidance of a senior team member.
- 3. Perform unit test operation for each function to ensure expected result.

Sixth Month instructions from my Team Lead.

In this month also, I have developed a number of Web Pages and API's and reviewed a few web pages and API's for the organization working with the main team.

Challenges : Challenges remained the same as previous month. Error and bus fixations while developing the tasks.

Chapter 4: Professional Growth

4.1 Technology and Tools I Learned

As Leads develops its tools in various technologies. As an intern, I saw them very closely and I gradually started to desire to learn them. And I have to learn them.

4.1.1 Tools

Programming tools make development easier. In my Intern at Leads I have to use the following tools in my daily works:

- Visual Studio Code
- Visual Studio 2019 & 2020 •
- Postman, Swagger
- PLSQL

4.1.2 Technology

4.1.2.1 JavaScript

JavaScript is a lightweight, interpreted programming language. It is designed for creating network-centric applications. It is complementary to and integrated with Java. JavaScript is very easy to implement because it is integrated with HTML. It is open and cross-platform.

```
const factorialOfNumber = number =>
number < 0
? (() => {
    throw new TypeError('No negative numbers please');
})()
    : number <= 1
    ? 1
        : number * factorialOfNumber(number - 1);

// EXAMPLES
factorialOfNumber(4); // 24
factorialOfNumber(8); // 40320</pre>
```

4.1.2.2 C#

C# is a general-purpose, multi-paradigm programming language. C# encompasses static typing, strong typing, lexically scoped, imperative, declarative, functional, generic, object-oriented, and component-oriented programming disciplines.

```
Program.cs x

1  using System;

2  
3  namespace DotnetBot {

4  
5  public static class Program {

6  
7  public static void Main(string[] args) {

8  
9  string message = "";

10  if (args.length < 1) {

11  message = "Welcome to .NET Core!";

12  }

13  else {

14  foreach (string item in args) {

15  message += item;

16  }

17  }
```

4.1.2.3 Vue.js

Vue.js is an open-source model—view—view model front end JavaScript framework for building user interfaces and single-page applications.

4.1.2.4 Asp.NET Core

ASP.NET Core is a free and open-source web framework and successor to ASP.NET, developed by Microsoft. It is a modular framework that runs on both the full .NET Framework, on Windows, and the cross-platform.

ASP.NET Core is designed to allow runtime components, APIs, compilers, and languages evolve quickly, while still providing a stable and supported platform to keep apps running

The MVC Request Life Cycle

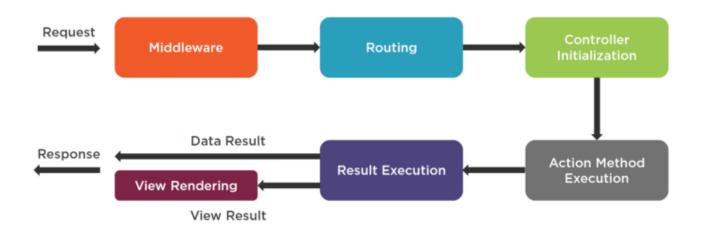


Fig : Asp.NET Core request Life cycle

```
[Route("api/[controller]")]
[ApiController]
public class BooksController : ControllerBase
{
    private readonly BooksContext _context;

    public BooksController(BooksContext context)
    {
        _context = context;
    }

    // GET: api/Books
    [HttpGet]
    public async Task<ActionResult<IEnumerable<Book>>> GetBooks()
    {
        return await _context.Books.ToListAsync();
    }
    //...
}
```

Fig: Asp.NET Core controller code snippet

4.1.2.5 Oracle

Oracle Database is a multi-model database management system produced and marketed by Oracle Corporation. It is a database commonly used for running online transaction processing, data warehousing and mixed database workloads.

Structured Query Language (SQL) is the set of statements with which all programs and users access data in an Oracle database

4.2 Professional Learning

Although technical learning is important, professional learning is the sole purpose of an internship. Leads is an excellent place to learn professionalism.

4.2.1 No bullying and blaming

Software development is always teamwork. And in a team, all members don't have similar skills or knowledge. This is true for Leads too. During my time of internship, I have made many mistakes like not maintaining code structure. And sometimes I get stuck in a problem for many hours. But my teammates had never been harsh with me. They always encouraged me to ask for help when I was stuck for some hour. But they did not solve the problem themselves unless it was necessary. They always used to suggest an approach for how to solve that problem. They always encouraged us to dig into the errors.

This practice is effective to keep the work environment healthy. Blaming others for their mistakes does not solve the problem. It only makes the situation and the relationship between coworkers worse.

4.2.2 Always Complete your work

At Leads, Everyone is assigned to a particular work. At times of scrum, everyone shares their progress with others. All the projects are done in this way.

4.2.3 Appreciate success, do not discourage for failure

The team I have been assigned to has taught me the value of appreciation. Here, the members appreciate each other on their successful contribution to the company and also on their success in some other fields.

The employees do not discourage people from failure in a particular task. People who can have expertise in that field help others.

Leads gives time to its employees to learn and work at the same time. It has a really good work environment.

4.2.4 Attitude

Leads employees are very friendly. As an intern, that amazed me and I always try to follow them to be a successful Software Engineer as well as a successful man.

4.2.5 Quality of work

Leads follow a great standard of pure software engineering and its product quality is very high. Time to time code is reviewed so that better quality software is developed. I tried to maintain the standard of work from my side.

They have a really good reputation for completing a very complex time within a short period, maintaining the quality and architecture of code.

4.3.6 Planning before doing

Before starting to implement a product, the assigned developer creates a plan under the direct supervision of the Team Leader.

This planning contains almost every detail for the implementation of the product.

This generally includes:

- Understanding the high-level view of the product
- Architecture to follow
- Create low-level details for the product
- Task breakdown
- What tools to be used
- Implementing the base for the product
- And many more ...

4.3.7 Organizing

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

Chapter 5: Conclusion

5.1 Conclusion

The six months of Internship was a time of experimentation. Internship in an intermediate period of the academic calendar is exceptional from the perspective of our country. From that point of view, this is a matter of glory that during the internship I have passed the best academic period in my life by experiencing

real-world technology. It is a matter of grandeur that what I read yesterday at the book is now available to me. Moreover, gathering a vast knowledge about how the real-world works can help me to prepare myself for an upcoming working life for me.

I would like to convey my thanks to the Institute of Information and Communication Technology, Shahjalal University of Science, and Technology for providing me an opportunity to gain an idea of the competitive environment in the professional field. It has certainly lifted my software development skills in terms of design and coding. I now look forward to facing the upcoming challenges of the world.

LEADS Corporation Limited is a company in Bangladesh with its innovative and reputed products. So, it was a great opportunity for me to complete my internship period as an effective member of the development of Leads. Concerning the assigned project work I had, it was interesting to implement something else that I was taught in my bachelor program. It was interesting to me from different points of view. It was a real pleasure to work in an office with corporate culture. Moreover, working in a team and a friendly official environment made me learn different things. Even though that was something new for me, I was able to change myself with this. Different tools and technologies, experienced human resources, a large range of business domains, innovative products, inspirational and motivating higher authority and friendly environment were the most significant factors to learn professionalism, positive attitude, winning mentality, self- initiative, team strength.

In a word, this internship was a great experience for me. And I hope that this experience will give me inspiration and instruction to build up to me a better future