



Patient & Inventory Management System

By

MD Masbahul Momin Sohan

Student ID: **1730369**

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Supervisor:

Bijoy Rahman Arif

Internship Supervisor & Lecturer

Department of Computer Science & Engineering

Independent University Bangladesh

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**Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in
Computer Science**

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation:

I am, Masbahul Momin, hereby certify that none of the work that has been done in this report is plagiarized or copied from anywhere. Any resources used are mentioned in the reference section of the report. No help was asked for during the completion of the report from a third party organization except the one that I have worked for in the last 3 months as an intern.

For any information, my internship supervisor, Mahtab Uddin Khan, at my company, Bengal Software Limited, can be contacted on 01816811482

Sincerely

Masbahul Momin

7th August 2021

MD Masbahul Momin

Acknowledgment

First and foremost, I want to thank Almighty Allah for giving me the endurance and the courage to work hard even in this great pandemic. It is my privilege to have the opportunity to do Bengal Software internship. I want to thank all the people I'm doing my internship on.

I would like to express my deep appreciation to my internal supervisor, Bijoy Rahman Arif , Lecturer, School of Engineering, Technology and Science, Independent University, Bangladesh (IUB), for his invaluable directions, ongoing encouragement, constructive criticism and insightful advice while pursuing this internship and preparing this paper.

It has been a great experience to work as an intern in a startup organization like Bengal Software Ltd. I would like to express my gratitude to Bengal Software firm for giving me a chance to work with them and for helping me work from home as well as giving me an opportunity to work at office to understand the office culture better and making the transition from a student to a software developer much smoother all during this COVID-19 pandemic. I am also thankful to them for allowing me to gather information and helping me in every possible way in preparing the report. My endless thanks to Mr. Mahtab Uddin Khan, Managing Director and CEO, Bengal Software Limited, for supporting me during my internship. I would like to thank all my college and co-developers, Mr. Fahim Ashab, Mr. Mushfiq and Mr. Kazi Rafi of the development department at Bengal, for guiding me and also giving me the chance to be familiar with the organizational environment and experiencing the procedures practiced at Bengal Software Limited. I believe that the experience that I have gained during the length of the internship program in this company should be vital for my future and career as a software developer.

Last but not least, I want to thank my parents and other family members for giving me their eternal support forever.

MD Masbahul Momin Sohan

7th August 2021

Dhaka, Bangladesh

Letter of Transmittal

7th August, 2021

Bijoy Rahman Arif

Internship Supervisor & Lecturer

Department of Computer Science and Engineering

School of Engineering, Technology and Sciences

Independent University, Bangladesh

Subject: Internship report on 'Web application for an online inventory management' for Bengal Software Limited.

Dear Sir,

With due respect and humble submission this is to inform you that I am student of computer science and engineering at independent university Bangladesh. It is my pleasure to submit to you my internship report on 'Web application for an online inventory management' for Bengal Software Limited. This report has been prepared based on my three – month internship at Bengal Software Limited and the project that I had been working on during that time. The purpose of this report was to fulfill the requirements of the Bachelor degree of Computer Science and Engineering and also to gain an insight on how the organizations are dealing with the ongoing COVID-19 pandemic. I tried to give my best effort to make this report successful. It has been an instructive and knowledgeable experience for me to work along with development team in Bengal Software Limited. I would be really happy if the report that I have created is able to serve its purpose. I am grateful to you for dedicating your valuable time, expertise, guidance and support. I have tried my best to complete the report appropriately as much as possible. I would be available to explain any kind of queries related with my report anytime.

I, therefore, pray and hope that you would like and grant my report and give me an access to go a long run.

Thank you.

Yours sincerely,

MD Masbahul Momin Sohan

Evaluation Committee

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Supervisor

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Internal Examiner

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External Examiner

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Convener

Abstract

This is an internship report on the project that has been provided by Bengal Software Limited, as required by the Bachelor of Science (BSc) program in Independent University, Bangladesh. The objectives of the study are to analyze the different aspects of my internship at Bengal Software Limited, to distinguish and resolve problems that are associated with the given project of “Inventory management System”.

Well, we going through a pandemic situation since 2.5 years. In this Covid-19 situation at Bangladesh the health system is broken down. People are not getting proper treatment at nearby hospitals and other health care institutes. Even it is very hard to reach people with food, medicine and other necessary goods because of lock down situation. Now medicine is become most needy product for people. Also some lifesaving drugs like snake venom which are very rare in our rural areas. Many people are die because of snake bite every year in our country. They are not getting vaccine in time. So, I get an idea for those medicine company who sells this type of life saving drugs and also for the rural areas patients. I want to build an online platform where patient can easily order their product as normal or emergency delivery system and Medicine Company should have proper delivery system to serve their product at customer’s respective address.

This is a web based application where the users can access using the internet. In the application user can order their own product, if they can’t access internet they can call hot line number. There is a customer service panel in the application where an agent can easily post the customers demand.

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Chapter 1: Introduction

Development of Web applications is the method and practice of designing web applications and their functionality. A web application is a computer program that utilizes web browsers and web technology to perform tasks over the Internet. Millions of businesses use the Internet as a cost-effective communications channel. It lets them exchange information with their target market and make fast, secure transactions. However, effective engagement is only possible when the business is able to capture and store all the necessary data, and have a means of processing this information and presenting the results to the user.

Web applications use a combination of server-side scripts (PHP and ASP) to handle the storage and retrieval of the information, and client-side scripts (JavaScript and HTML) to present information to users. This allows users to interact with the company using online forms, content management systems, shopping carts and more. In addition, the applications allow employees to create documents, share information, collaborate on projects, and work on common documents regardless of location or device.

1.1 Background

Patient & inventory management, also known as supply chain management (SCM) is a workflow responsible for keeping track of a health system's inventory, purchases, orders, payments, and more. An inventory management system is key in healthcare organizations that need to keep track of medical supplies, order and dispense prescriptions, or sell health products to patients. Within large organizations, inventory management strategies help protect a company from both monetary and product losses, by keeping an updated and accurate log of products and supplies.

The "Patient & Inventory Management System" web application is designed to promote portability of health care especially in this time of pandemic. The approach was taken for the help of patients throughout all over the country, where the patients can login easily to the website to have their demand product.

1.2 Objectives

The objectives of inventory management are operational and financial. In operational, materials and stock should be available in sufficient amount whereas, in functional, the minimum working capital should be locked in. The objectives of Patient & inventory management are as follows:

- To ensure a continuous supply of materials and stock so that production should not suffer at the time of customers demand.
- To avoid both overstocking and under-stocking of inventory.
- To maintain the availability of materials whenever and wherever required in enough quantity.
- To maintain minimum working capital as required for operational and sales activities.
- To optimize various costs indulged with inventories like purchase cost, carrying a cost, storage cost, etc.
- To keep material cost under control as they contribute to reducing the cost of production.
- To eliminate duplication in ordering stocks.
- To minimize loss through deterioration, pilferage, wastages, and damages.
- To ensure everlasting inventory control so that materials shown in stock ledgers should be physically lying in the warehouse.
- To ensure the quality of goods at reasonable prices.
- To facilitate furnishing of data for short and long-term planning with a controlled inventory.
- To supply the required material continuously.
- To maintain a systematic record of inventory.
- To make stability in price.

1.3 Scopes

- Determination of economic order quantity
- Formulation of policy
- Determination of lead time
- Effectiveness towards running of store
- Organization structure
- Determination of safety stock
- Minimum material handling and storage cost.

Chapter 2: Literature Review

The literature review of the report is based on the ideas, theories and methodologies used to make the application. On this literature review, different aspects of the application such as the market analysis both for local and global markets, similarities and new functionalities included in this application will be thoroughly discussed. The report will also discuss relevant published journals, newspaper articles and research papers in this section.

The purpose of literature review is to identify need for additional research (justifying your research) Identify the relationship of works in context of its contribution to the topic and to other works. Place your own research within the context of existing literature making a case for why further study is needed.

2.1 Relationship with Undergraduate Studies

Throughout the undergraduate studies, from 'Hello World' to solving complex mathematical equations, were the basics of understanding how the real world applications work in general. To have the opportunity to do that and find the relevance of the project with some of the courses that are taught throughout the 4 year undergraduate course in IUB was simply exemplary. Since the project is a web based applications courses such as the CSE 203- Data Structure, CSE 211- Algorithm were the building blocks of understanding how a project data can be handled. The tools learnt from courses such as CSE 309- Web Application and Internet, CSE 303 – Database Management and CSE 213- Object Oriented Programming helped me to build and code the entire project. Finally courses like CSE 451- Software Engineering, CSE 458 – Software Quality and Testing and CSE 457–Project Management helped me how to handle a project from start to bottom. It should be said most of the courses that has been taught had some sort of contribution to my knowledge in the building part of the project.

2.2 Related Works

- **ERPAG**-- ERPAG is an ERP cloud service that covers all business processes for small or mid-sized companies. Inventory and order management in real time. FEATURES: Reordering. Order fulfillment. Cloud label printing. Inventory tracking (Barcode, Serial, Lot). Multiple UOMs. Multiple warehouses. Multiple currencies. Multi-language interface. Composite products (BOMs, Kitting, Variable items). User level management. Integrated invoicing and purchasing module. Supports manufacturing.
- **Alfa POS**—POS software tailored specially for retail, distribution and small businesses. Manage daily sales, inventory, purchasing, financials and customers with ease and simplicity. This fully integrated application has a range of financial tools, such as Bookkeeping, Accounts Receivable & Payable, multi-currency management, Tax calculation, Profit & loss, Cash reports and Customer Loyalty Programs.
- **Odoo**-- Odoo Inventory is expertly designed to help companies improve their internal operations, specifically by providing them with the most efficient stocking methods imaginable. Users can wisely manage their warehouse, and maximize their inventory, by reducing stock levels and avoiding unnecessary stock-outs. With Odoo's innovative double-entry system, inventory has no stock input, output, or transformation - all operations are simply stock moves between locations.
- **Smart IP&O**-- Smart Software offers Smart IP&O, an integrated set of native web applications for demand planning, inventory optimization, and supply chain analytics. It provides a single, easy to use, easy to scale, easy to collaborate, environment with robust inventory and forecast modeling. Our implement one, implemented for all approach means you can address a discrete set of needs initially and add new apps when ready without additional implementation costs.
- **Megaventory**--Web-based inventory management, order tracking, invoicing and reporting for medium-sized companies across multiple locations - including production. See stock alerts, supplier availability and lead times. Track stock levels, cost, and inventory value over time. Handle picking, serials, batches and expiry dates, barcodes, returns, consignment, drop shipping and internal transfers. User-friendly interface, comprehensive support and value for investment! Signup for a free trial or book a demo today.

- **QuickBooks Desktop Enterprise**-- QuickBooks Enterprise is an end-to-end accounting software that can grow with your business. It provides all the tools your business needs, yet is easy to use. You can organize your books, manage inventory, track sales, and even run payroll, but at the fraction of the cost. With QuickBooks Enterprise, you save thousands of dollars a year vs. comparable solutions. Powerful and flexible, it also comes in editions designed to fit your specific needs. Take a free test drive today.
- **Xero**-- Easily keep tabs on your stock quantity and value with Xero inventory management tools. Know your best-selling and most profitable product lines and see how much profit you're making. Use this information to make the right decisions about what to order and how to price it. At the same time, save time with bulk imports. It's simple to get inventory in Xero up and running by quickly importing large numbers of inventory items from a spreadsheet.
- **Asset Panda**-- Asset Panda is a powerful Cloud/Mobile App inventory tracking platform. It helps people track, manage and support their inventory throughout their life cycle. This software configured to the way our clients work, secure and leverages the mobile devices your employees already carry.
- **EZOfficeInventory**-- leading asset tracking software enables you to manage inventory and assets across a company. Track vendors, move inventory across locations, and customize low stock threshold alerts for optimized inventory management. Scan Barcodes, QR Codes and RFID tags to perform mass actions and use our mobile apps to manage operations on the go! Their procurement module allows quick inventory replenishment through POs which automatically update your product catalog.

Chapter 3: Project Management

To start a project, every company has to create a timeframe through which every aspect of the project has to be determined, planned and execute according to this plan or schedule. This works as a guideline for the company to track the progress of the project and to make sure the smaller goals and deadlines have been met. A guideline with diagrams is shown in the next figures mainly through the Work Breakdown Structure, Gantt chart and Database design.

3.1 Work Breakdown Structure (WBS):

Breaking work into smaller tasks is a common productivity technique used to make the work more manageable and approachable. For projects, the **Work Breakdown Structure (WBS)** is the tool that utilizes this technique and is one of the most important project management documents. It singlehandedly integrates scope, cost and schedule baselines ensuring that project plans are in alignment. A good WBS is simply one that makes the project more manageable.

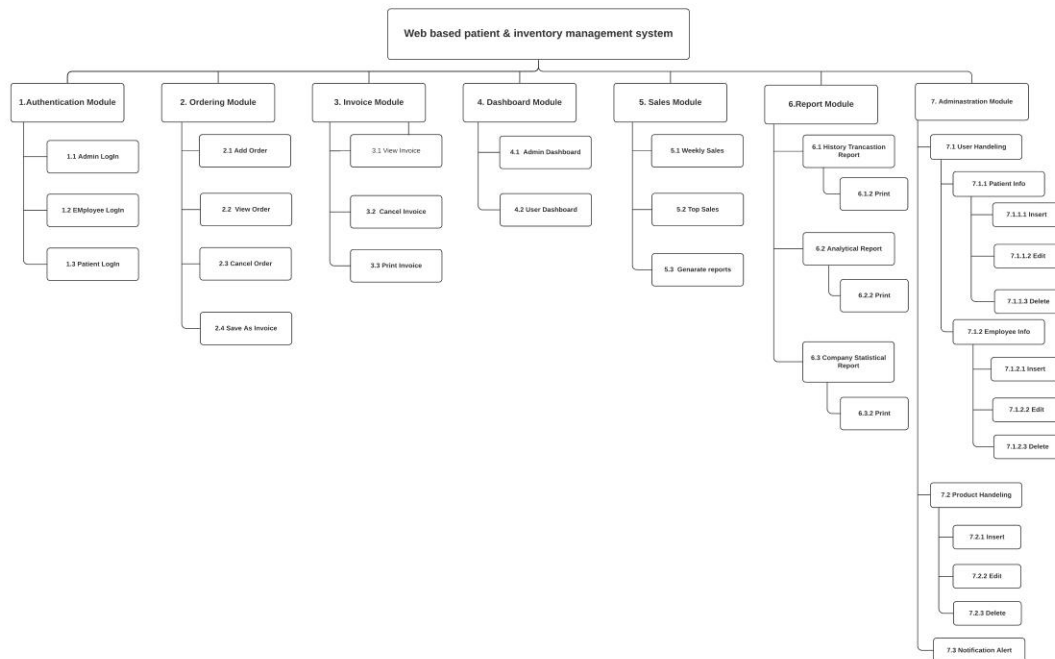


Figure 3.1: Work Breakdown Structure

3.2 Process/Activity wise Time Distribution

The time allocation for the 3 months project is shown on a chart using the critical path method. The critical path is the longest sequence of activities in a project plan which must be completed on time for the project to complete on due date. An activity on the critical path cannot be started until its predecessor activity is complete; if it is delayed for a day, the entire project will be delayed for a day unless the activity following the delayed activity is completed a day earlier.

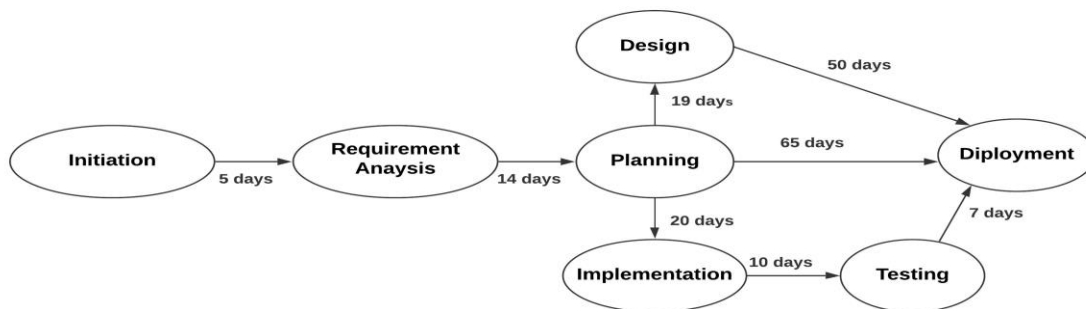


Figure 3.2: Critical Path

3.3 Gantt Chart

A Gantt chart is a project management tool assisting in the planning and scheduling of projects of all sizes, although they are particularly useful for simplifying complex projects. Project management timelines and tasks are converted into a horizontal bar chart, showing start and end dates, as well as dependencies, scheduling and deadlines, including how much of the task is completed per stage and who is the task owner. This is useful to keep tasks on track when there is a large team and multiple stakeholders when the scope changes.

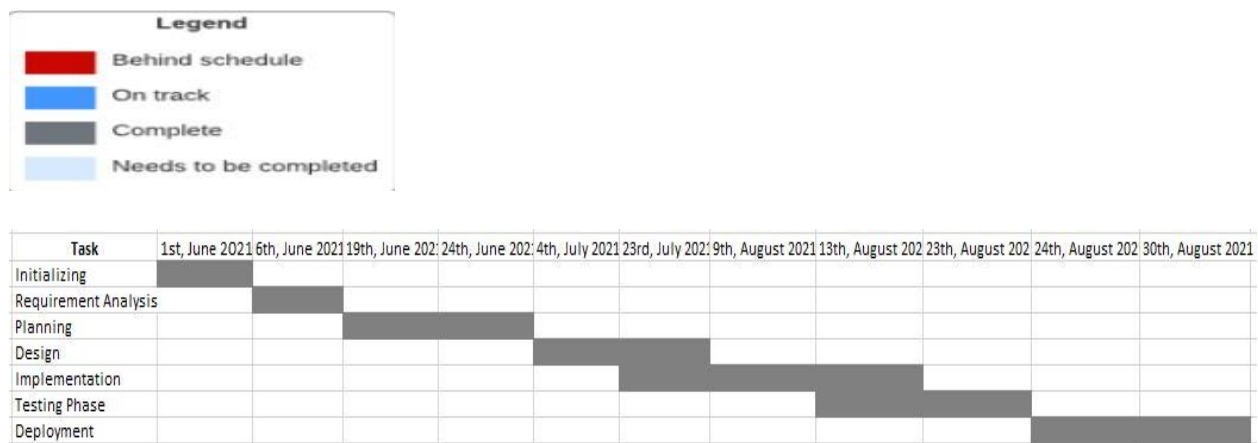


Figure 3.3: Gantt chart

3.4 Process Wise Resource Allocation

For this project, the developers are considered as the primary resource followed by the computers used in the office, the servers (VPS) required for the deployment of the project. Every employee of the company is considered a resource, hence everyone has assigned a particular assignment with certain deadlines, all of which collaborated to the entire production of the project. Following are the details of every step of the project.

1. **Initializing:** This is the first period of the project, where the idea of the project was presented by the CEO of the company. Since this was a in-house product, no delay was made and the paperwork for the project was started.
2. **Requirement Analysis:** During the first few weeks the CEO and the developers discussed the entire requirements for the completion of the project. For example, Computer specifications, software/tech to be used to build the application, features and developers required.
3. **Planning:** In this section of the development process, the developers and the CEO engaged in hours of discussion of how this project should be built from top to bottom, the approaches to be taken, creating smaller goals and setting deadlines for them.
4. **Design:** In this phase few graphic designers were hired for designing the web pages of the application as well as the management team started working on the high level and low level diagrams for the project in order the get the bigger picture on sight.
5. **Implementation:** At this stage, the designs for the web pages were complete and the developers started working on writing the code for the front end and backend of the application, while the management team kept regulating whether all the deadlines were maintained.
6. **Testing:** Testing started as soon as a feature was added to the site. Hence simultaneously the testing was being carried out by the developers. At the end of the implementation phase unit testing for the application started.
7. **Deployment:** After the testing was truly completed, the team realized that it was behind schedule. For deployment, a VPS (Virtual Private Server) and a domain was bought to deploy the application on a live server.

3.5 Estimated Costing

Table 3.1: Cost Estimation table

Requirements	Quantity	Amount (BDT)
Salary Payments (3 months)	1	24000
Computers (desktop)	1	30000
Printer	1	8000
Electricity Bill (3 months)	1	3600
Domain/Server/Hosting	1	1500
Desks	1	1800
Internet Bill (3 months)	1	3600
Subtotal	-	82500

Chapter 4: Methodology

Successful projects are managed well. To manage a project efficiently, the manager or development team must choose the software development methodology that will work best for the project at hand. All methodologies have different strengths and weaknesses and exist for different reasons. For this project the Bengal development team has used, like most modern applications, the agile software development life cycle. Other methodologies includes:

- Waterfall
- Prototyping
- Iterative and Incremental Development
- Spiral Development
- Rapid Application Development
- Kanban methodology
- Extreme programming (XP) methodology
- Adaptive project framework (APF) methodology.
- Lean methodology.

4.1 Agile Development

The Agile software development methodology is one of the simplest and effective processes to turn a vision for a business need into software solutions. Agile is a term used to describe software development approaches that employ continual planning, learning, improvement, team collaboration, evolutionary development, and early delivery. It encourages flexible responses to change. The agile software development emphasizes on four core values:

1. Individual and team interactions over processes and tools
2. Working software over comprehensive documentation
3. Customer collaboration over contract negotiation
4. Responding to change over following a plan

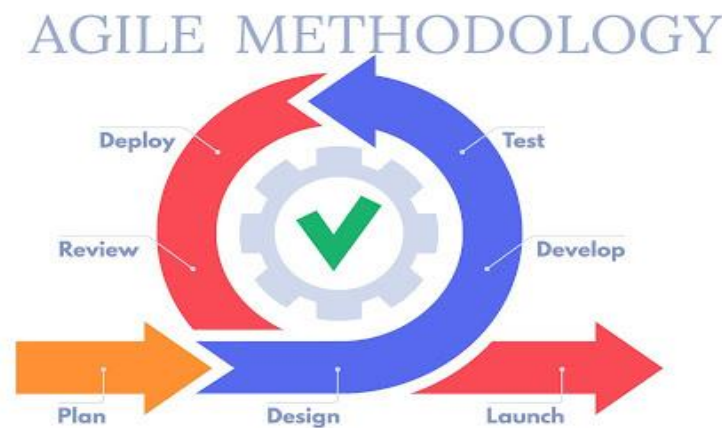


Figure 4.1: Agile Methodology

4.2 Why Agile for this project?

The primary benefit of agile software development is that it allows software to be released in iterations. Iterative releases improve efficiency by allowing teams to find and fix defects and align expectation early on. They also allow users to realize software benefits earlier, with frequent incremental improvements. When the development process began there were lack of information in the requirement section of the project, which eventually got added up in the future. As new features and updates on design patterns got updated the design team implemented them in a progressive manner much like what the agile methodology suggests.

4.3 Agile Implementation

Agile implementation is a form of project management that works in small increments and well suited to projects that could become irrelevant once delivered, especially useful in software development. The key to the agile plan is that it provides flexibility for changes to the product as it continues to be developed.

The entire plan was decided when determining the requirements during the planning phase, how the development team made sure they divide all the work according to daily basis. Every day some of the coding section of the project would be implemented and at the end of the day a meeting would be conducting between the development team and the management committee to make sure all functionalities that had been implemented throughout the day, was valid and up to the standards as well as the requirements, any changes suggested could be implemented accordingly.

Chapter 5: Body of the Project

5.1 Work Description

This is my own project. I have handled front end and back end both. The front end built with the Reactjs framework of JavaScript language and mainly building REST API's for the backend using the Express framework of Nodejs. Every day a target of the tasks to be completed throughout the day would have been appointed to me, and at the end of the work day those targets needed to be fulfilled and explained properly.

5.2 System Analysis

5.2.1 Six Element Analysis

Table 5.1: Six Element Analysis Table

Process	Human	Non Hardware	Hardware Computing	Software	Database	Communication Network
Log In/Sign Up	Users enters phone No and password	NID number when register	Keyboard, Mouse and Computer	Web Browser	Stores register data and retrieves login data	Internet
Post Order	Users fills up respective forms		Keyboard, Mouse and Computer	Web Browser	Stores data and retrieves data	Internet
Post Invoice	User Check info and post		Keyboard, Mouse and Computer	Web Browser	Stores data and retrieves data	Internet
Print Invoice	User Check info and press print		Keyboard, Mouse, printer and Computer	Web Browser		Internet
Post Product	Users fills up respective forms		Keyboard, Mouse and Computer	Web Browser	Stores data and retrieves data	Internet
Post Employee	Users fills up respective forms	NID number when register	Keyboard, Mouse and Computer	Web Browser	Stores data and retrieves data	Internet
Statistical Analysis	Generate reports		Keyboard, Mouse, printer & pc	Web Browser	retrieves data	Internet

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5.2.2 Feasibility Analysis

Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software. Feasibility study is carried out based on many purposes to analyze whether software product will be right in terms of development, implantation, contribution of project to the organization etc. There are different types of feasibility studies that are conducted such as:

- **Technical Feasibility:** In Technical Feasibility current resources both hardware, software along with required technology are analyzed and assessed to develop project. Questions such 'Is the application upgradable?', 'Technical capabilities and skills of the developers?' are answered in this section. For this current applications the scalability depends on the number of users of the application, since it is a module based application any addition of a module can easily be added or removed if required. A downside of the program is that the application has become very technical, therefore non-technical users might have a harder time to understand the program completely.
- **Operational Feasibility:** It assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. The major users of the application are the freelancers, one of the most critical barrier is the language barrier, the application is developed completely in English, hence without understanding the language it should be harder for the user to guide through the program specially in the rural parts of the country
- **Economic Feasibility:** Economic analysis is the most frequently used method for evaluating the effectiveness of the candidate system. More commonly known as cost/benefit analysis& the procedure is to be determining the benefits and sayings that are expected from a candidate and compare them with costs. If benefits outweigh costs& then the decision is made to design and implement the system.

A system financial benefit must exceed the cost of developing that system. i.e. a new system being developed should be a good investment for the organization. Economic feasibility considers the following:

1. The cost to consider a full system investigation.
2. The cost of hardware and software for the class of application.
3. The benefit in the form of reduce cost or fewer costly error.
4. The cost if nothing changes(i.e. The proposed system is not developed)

The proposed “Inventory Management System” is economically feasible because

1. The system require very less time factors.
2. The system will provide fast and efficient automated environment instead of slow and error prone manually system, thus reducing both time and man power spent in running the system.
3. The system will have GUI interface and very less user-training is require to learn it.
4. The system will provide service to view various information for proper managerial decision making.

5.2.3 Problem Solution Analysis

Problem analysis is the process of understanding and defining the problem to be solved. Problem solving identifies solutions that conform to the needs and constrains of the problem. Much of what is done in designing and building information systems is to solve problems, even though the objective of the system may be seen as improving existing systems or taking advantage of market opportunities.

5.2.4 Effects and Constraints Analysis

A constraint is a restriction on the degree of freedom a company can have in providing a solution. Constraints are effectively global requirements, such as limited development resources or a decision by senior management that restricts the way the development team develop a system. Constraints can be economic, political, technical, or environmental and pertain to project resources, schedule, target environment, or to the system itself. Some of the constraints and its effects are described below:

5.3 System Designs

5.3.1 Rich Picture

A rich picture is a drawing of a situation that illustrates the main elements and relationships that need to be considered in trying to intervene in order to create some improvement. It consists of pictures, text, symbols and icons, which are all used to illustrate graphically the situation. It is called a rich picture because it illustrates the richness and complexity of a situation.

In the following rich picture there are three types of users Admin, Employee and Patient user. Patient User can register by own or they can call hotline number for registration. After Registration Patient user will get his ID and Password as an OTP message at his/her phone number. Then he can add, view and cancel order. Employee Also can Add, view and Cancel Order. After viewing the order if the order is deliverable then employee will Invoice the order and print the Invoice. Admin can analyses statistical reports and generate report also can add, delete, edit & view products and Employee. All those data will store in Server and retrieve from server storage.

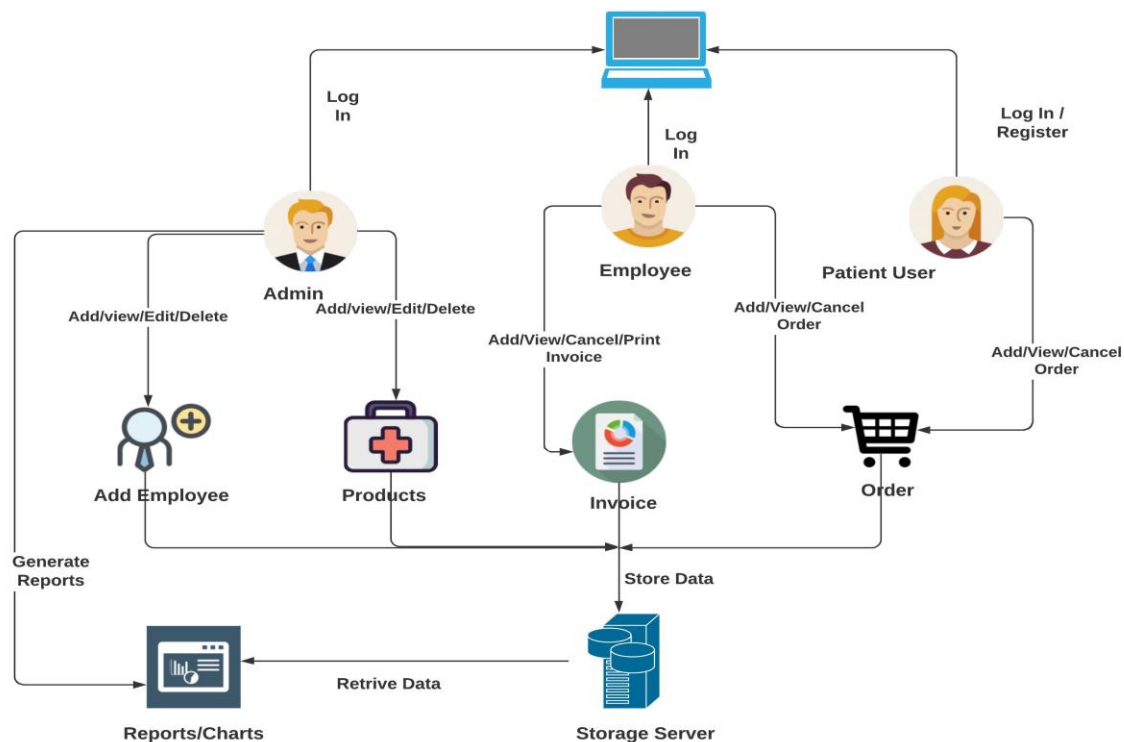


Figure 5.1: Rich Picture

5.3.2 UML Diagrams

A UML diagram is a diagram based on the UML (Unified Modeling Language) with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the system. In this section, the activity diagram for all the user groups is shown, Activity diagram is essentially an advanced version of flow chart that modeling the flow from one activity to another activity.

Activity Diagram for Admin

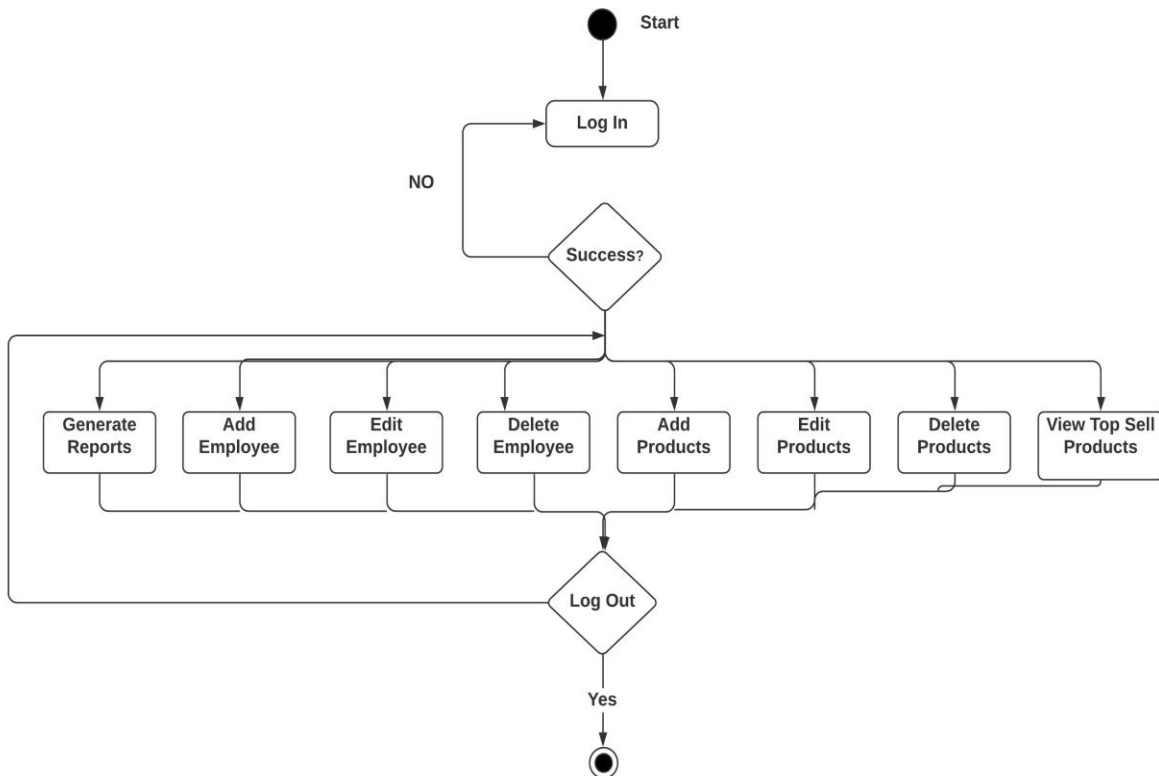


Figure 5.2: Activity Diagram for Admin

Activity Diagram for Employee

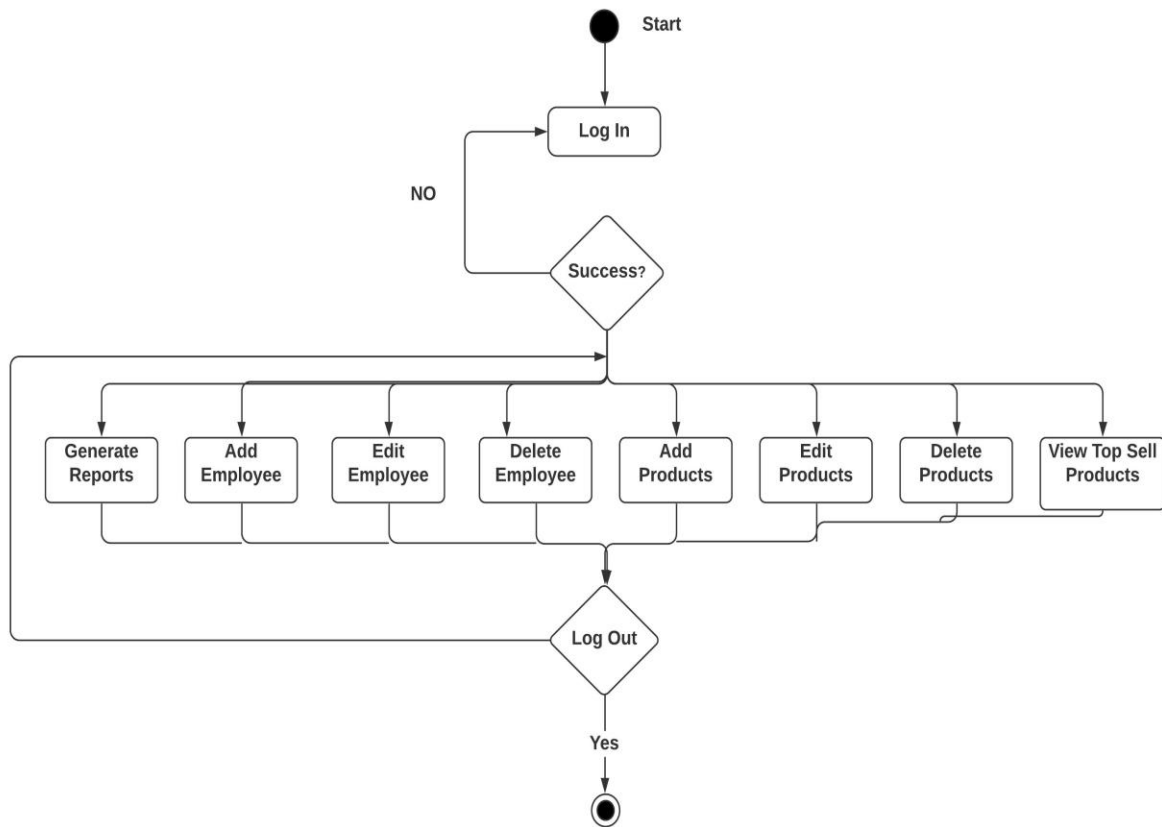


Figure 5.3: Activity Diagram for Employee

Activity Diagram for User

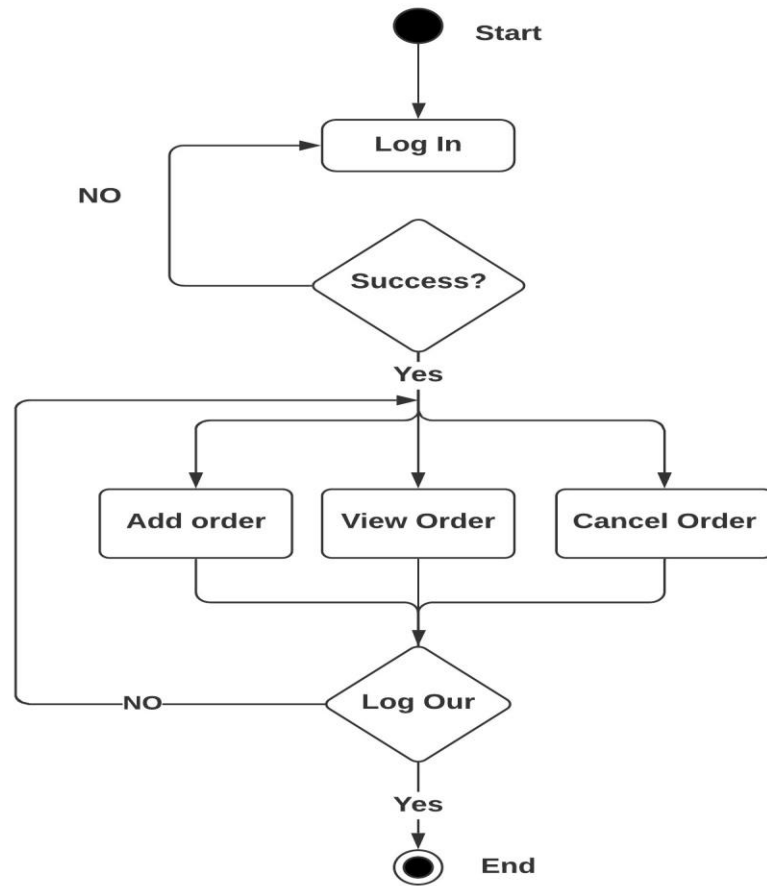


Figure 5.4: Activity Diagram for Patient User

5.3.3 Functional and Non-Functional Requirements

Functional Requirements:

- When the user enters information for registration and login, the application sends approval if information is correct and redirects to user dashboard per role.
- Upon registration the system must send a confirmation message with user ID and Password to corresponding Phone no within 10 minutes.
- Forms filled in every order post on success the user is redirected towards the corresponding display page.
- On every order, the application will send a confirmation message to customer phone number.
- In every 5 hours if the user has already logged in through a browser, the user is automatically logged out.
- The system allows admins to show the activity of every user i.e.: Order submission, Invoice order etc.

Non-Functional Requirements:

- On any POST request (Registration, Login, Order) the database on receiving the data, saves the information on the database and responds with a status of 200, else if there is a problem saving, it responds with a status of 400 or 404
- The layout shall allow users to reach their profile data from any page within 2 clicks.
- The background color for all screens shall be '#f5f5f5'
- On Invoice slip, the data saved must be in pdf.

5.4 Product Features

Login and Registration: Like any other web application that contains user systems, login and registration is the most common features of any application. Upon registration a mail is sent to the user mail for verification upon complete verification, the user then can login to the system.

Order: Employee and Patient-user both can access order panel to submit order. Users will select necessary information and necessary item with respective quantity and submit order to nearby branch.

Invoice: After checking the order if the order is deliverable then user will add the order as invoice and print the invoice for shipment.

Patient User: Employees can add, edit and view patients in Patient User panel. Admin can also perform these operation with delete patient.

Statistical Analysis & Generate Reports: Admin can see statistical analysis like weekly sales, weekly order, top sell products in Admin Dashboard also can generate reports as CSV or EXCEL file from the system.

Record of all information: The system will keep record of all the data starting from user data, products uploaded, order history, invoice history etc., which can be viewed by the admin in the admin dashboard.

5.4.1 Input

The following table shows the processes and the fields required for the inputs of the corresponding process.

Table 5.2: Input table with their fields

Process	Fields(Types)
Sign Up	Patient Name – String Care Giver Name – String Doctor's Name – String Phone Number – String Email Address – String NID/Passport/Driving license No – String Address – String Delivery Address – String
Sign In	Phone number – String Password – String

Order	Spot – String Patient- String Delivery Point- String Delivery Date- String Delivery Time – String Delivery Address – String Product – Array
Invoice	Invoice No – Number Invoice Date – Date Order By – String Order Data – Array
Employee	Name – String Phone No – String Address – String NID – String Branch – String Designation – String Salary – Number
Products	Products ID – String Products Name – String Batch No – String Expire Date – Date Trade Price – Number Discount – Number Vat – Number Total Price – Number

5.4.2 Output

Table 5.3: Output table with process

Process	Output
Sign Up	On Success – Alert Message: “New Patient Added Successfully” On Failure – Error shown under the field’s input
Sign In	On Success – Alert Message shown “Login is Successful” and redirect to user dashboard On Failure – Error shown under the field’s input
Order	On Success – Alert Message shown “New Order Added Successful” and redirect to Order Table On Failure – Error shown under the field’s input
Invoice	On Success – Alert Message shown “New Invoice Added Successful” and redirect to Invoice Table On Failure – Error shown under the field’s input
Employee	On Success – Alert Message shown “New Employee Added Successful” and redirect to Employee Table On Failure – Error shown under the field’s input
Products	On Success – Alert Message shown “New Products Added Successful” and redirect to Products Table On Failure – Error shown under the field’s input

5.4.3 Architecture

For developing this application, the Single Page Application or (SPA) was used. A single-page application (SPA) is a web application or website that interacts with the user by dynamically rewriting the current web page with new data from the web server, instead of the default method of the browser loading entire new pages. In a SPA, all necessary HTML, JavaScript, and CSS code is either retrieved by the browser with a single page load or the appropriate resources are dynamically loaded and added to the page as necessary, usually in response to user actions. The page does not reload at any point in the process, nor does it transfer control to another page (Flanagan, 2006). For the development JavaScript framework React was used for the front end and express framework of NodeJs was used for the backend. As for the database a NoSQL database called MongoDB was used. Overall a MERN (Mongo-Express-React-Node) stack was used to develop the entire application.

Front-End:

JavaScript is a programming language. It is designed to create network centric applications. It is complementary to and integrated with Java. Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. JavaScript enables interactive web pages and is an essential part of web applications. It has a lot of frameworks and libraries one of which is Reactjs. React (also known as React.js or ReactJS) is an open-source, front end, JavaScript library for building user interfaces or UI components. It is maintained by Facebook and a community of individual developers and companies. React can be used as a base in the development of single page or mobile applications. The reason React was used for the application was mainly due to the fact that it works well with NoSQL databases and in the future making mobile app for the application will be much simpler with React-native.

Backend:

Node.js is an open-source, cross-platform, back-end, JavaScript runtime environment that executes JavaScript code outside a web browser. Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic content before the page is sent to the user's web browser. For this application the express framework of Nodejs was used. Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications. The reason to use express was because the application was API driven. Hence REST API's were created using express.

Database:

MongoDB is a cross-platform document-oriented database program. It is a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. The reason for choosing MongoDB as the database was mainly due to the abundance of resource and has a huge number of built in functions also with no initial cost to maintain the database, it was the ideal database to choose.

Chapter 6: Results & Analysis

Inventory management is a systematic approach to sourcing, storing, and selling inventory—both raw materials (components) and finished goods (products). In business terms, inventory management means the right stock, at the right levels, in the right place, at the right time, and at the right cost as well as price.

Here we are implementing Patient and Inventory management system we can manage customers and products at a time. As a part of your supply chain, inventory management includes aspects such as controlling and overseeing purchases — from suppliers as well as customers — maintaining the storage of stock, controlling the amount of product for sale, and order fulfillment. Incentive

Chapter 7: Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

Thinking about the future, the company has made huge plans to make sure enough revenue is generated. Initially the goal is to make people convince to make order medicine to online in this pandemic period. The next plan is make campaign in city also in the rural areas that they can get lifesaving drugs as early as possible at their home because more user more revenue will come. Therefore this business plan should bring in more users to the application. Eventually more users means more revenue will be generated through this application. The program is made such that the application is scalable, any new functionalities by the developers can easily be integrated to the application.

7.2 Social and Environmental Effects and Analysis

Inventory management has a great effect on our Social and environmental life. In the inventory is medicine then it has a huge effect on our social and environmental life. Now a day's medicine are most needy item in our social life. Physical and mental health both are depend on this item. Some times in an emergency situation medicine are not find because of proper distribution and maintenance. In our rural areas this happen often. So a proper distributed inventory management with proper delivery system can

reduce this kind of situation. It will make our social life more easy and healthy. There are lots of medicine corner in every areas of Bangladesh. They don't store medicine in proper temperature also they sell out expire dated products. So general people easily cheated by those dishonest businessman. Also a proper distributed inventory management can reduce huge pollution of environment with the help of three r's reduce, reuse, recycle.

7.3 Addressing Ethics and Ethical Issues

A great deal of work has been done to make sure that the user data provided is secured. A lot of experts has been involved during and after the final completion of the project just to look into the security issues of the application. Certain guidelines from institutions such as from NHL guideline trustee committee is and will be followed. The application makes sure that the passwords set by the users are hashed and unavailable to others other than the admin. Another restriction of the program is to make sure that the products which are uploaded are comparatively within the market value range, any illogical price set may set warnings to the user who has uploaded the product.

8 Lesson Learned

8.1 Problems Faced During this Period

- Became familiar with new environment
- Unavailable transport during pandemic situation
- Lack of proper resource
- Lack of experience developer
- Daily Traffic
- Lack of better project management environment

8.2 Solutions of those Problems

- **Hard Working**

Chapter 9: Future Work & Conclusion

8.1 Future Works

For the future, as discussed above, this current application is just for the web. In the future the company has the target to create a mobile app for the application. Some of the functionalities will be on hold for now, such as selling health care instruments. The company looks to begin the application with just selling medicine. There are many design issues still which will be resolved in another month of testing and correction.

8.2 Conclusion

This report is based on the project of “Inventory management System” for the company Bengal Software Limited. The report goes through all the intricate details of the project from the conceptual level to the functional level and the design patterns. Although the project will be incomplete during the creation of the report, but most of the functionalities should in the application. The report also explains the sustainability and the methods where the application should bring in money for the company.

Throughout the internship period, working on this project has made me realize a few things. It has made me realize how diverse, competitive the real corporate world is. It has made me feel to make an actual difference in the real world. As an undergraduate student, it is really tough for any student to have an actual taste of how the real companies of the world works. But to actually live it for 3 months was a unique experience and hopefully will be the start of my journey into the corporate world as a developer.

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