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An Undergraduate Internship on Truck Management System

By

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Summer, 2022

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September 17, 2022

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

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This is to certify that the report titled "Truck Management System" was completed by Ayesha Binte Mustafa (ID- 1821588) submitted in partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Engineering (CEN) under the department of Computer Science and Engineering of Independent University, Bangladesh (IUB). This was completed under the supervision of Md. Abu Sayed of IUB as the internal supervisor and Yaseen Fida Hossain of 'GIM- Digital Truck' as the external supervisor. I further confirm that no work has been done in this report that is plagiarized or copied from anywhere. All sources used are mentioned in the references section of the report.



14/09/2022

Signature and Date

Ayesha Binte Mustafa

Name

Acknowledgement

I am grateful to the Almighty for blessing me with the opportunity and giving me the patience to work with my knowledge and accomplish my internship report timely.

I am indebted to my parents, not only for supporting me financially, but for always encouraging and appreciating me to accomplish the things that I have accomplished. I want to thank my family for being the pillar in my life that I can always count on and be by my side.

I would like to express my gratitude to my honorable IUB supervisor Md. Abu Sayed, Lecturer, Independent University, Bangladesh, who has helped me go through the whole process of making this report.

I'd like to thank 'GIM- Digital Truck' the company that that provided me with the opportunity to experience of corporate life via this internship, I'd like to thank Senior Manager of Product Management, Yaseen Fida Hossain, who acted as my external supervisor in this course, forming my path in the company and all other employees for being so helpful and supportive throughout the whole experience.

Ayesha Binte Mustafa

ID: 1821588

Student of SECS, CEN

Letter of Transmittal

14 September, 2022

Md. Abu Sayed

Lecturer

Department of Computer Science and Engineering

School of Engineering, Technology and Sciences Independent University, Bangladesh

Subject: **Internship report on 'Truck Management System' under GIM- Digital Truck**

Dear Sir,

I am very much thankful to have the opportunity of submitting to you my internship report on 'Truck Management System' at GIM- Digital Truck. This report has been prepared based on my three month internship period at GIM- Digital Truck 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's degree of Computer Science and Engineering. My experience working with the company has given me a better understanding of both the corporate life and teamwork. I will be happy if the report I created can achieve its goal. I am grateful to you for your valuable time, expertise, guidance and support. I have done my best to avoid my deficiencies and I hope that my report will live up to your expectations. I would also like to express my gratitude for giving me the opportunity to present this report.

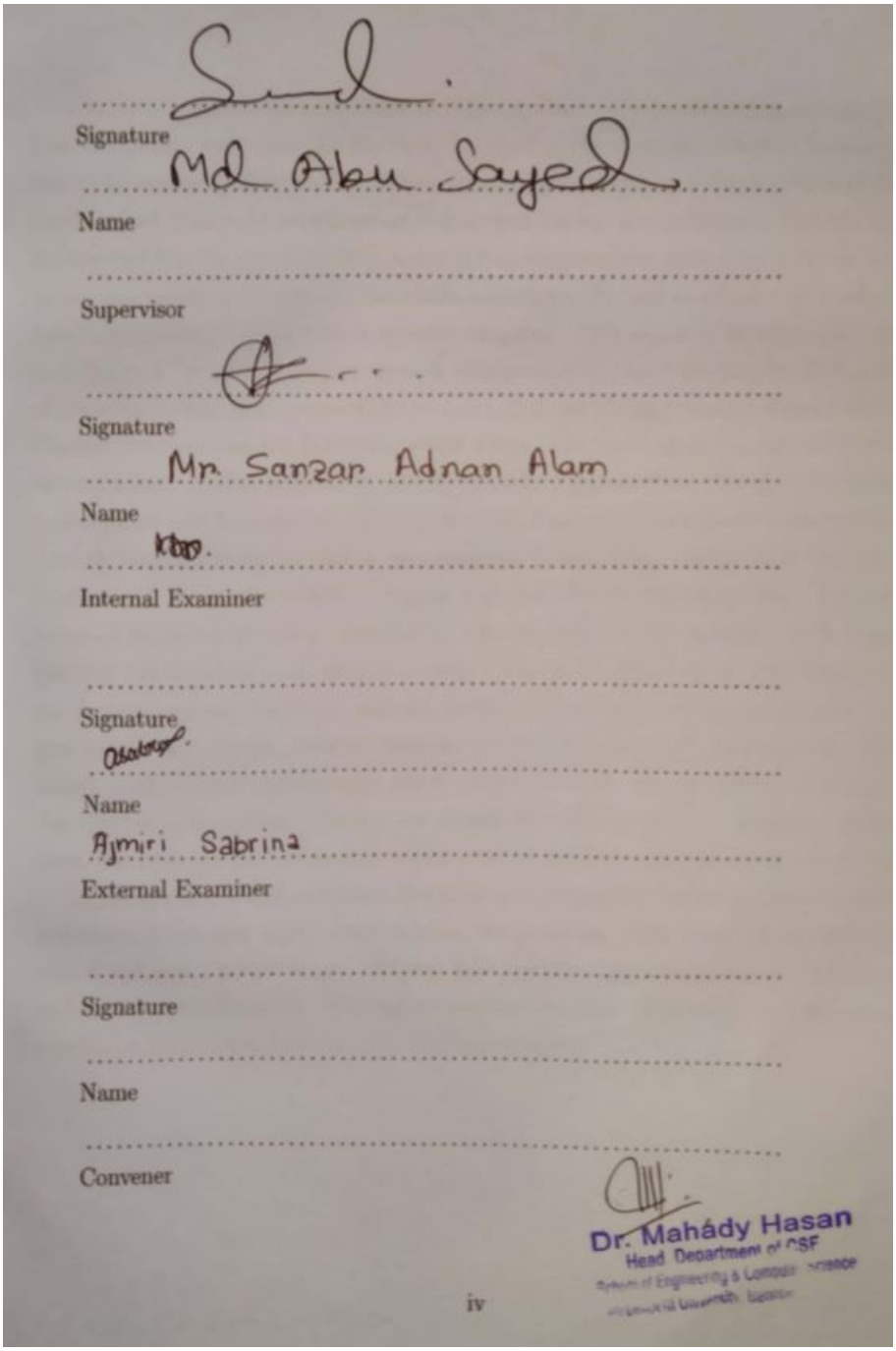
Sincerely,

Ayesha Binte Mustafa

ID: 1821588

Student of SECS, CEN

Evaluation Committee



Signature

Md Abu Sayed

Name

Supervisor

Signature

Mr. Sanzar Adnan Alam

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Internal Examiner

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Name

Ajmiri Sabrina

External Examiner

Signature

Name

Convener

Dr. Mahády Hasan
Head, Department of CSE

iv

Abstract

The company 'GIM- Digital Truck' is providing one of the most efficient Digital Freight Network in Bangladesh through its online platforms. Truck management system is used mainly by the users who need a truck for transporting goods, renting etc. from the system. The main objective of this project is to provide a nice experience to customers while renting trucks and provide an easier way to maintain and process the system.

In the existing system, when a customer hires a truck, the admin has to call a partner or truck owner individually and manually to rent their truck which is time consuming. However, we have decided to add a new feature to the partner app that, when a trip has been created the partner can see all the trip list and bid on them as their expected amount. As a result the best bidded amount will be accepted and the trip will be started automatically.

This service provides a nice experience to partner while renting trucks and provides an easier way to maintain and process the system. So this project will try to address and fix these issues. This report attempts to summarize that experience and provide a useful overview of what has been achieved.

This report contains an introduction to the project, project background, goals, scope of the project, and the organization I worked for and presents a literature review reviewing similar products and how my undergraduate studies helped me complete this project. I have covered project management, project financing and methodology. For the main project, the work description, six-factor analysis, big picture, feasibility analysis, problem analysis, impacts and limitations, activity diagram, inputs, outputs and more has been covered by me. Besides, technical problem analysis sustainability, project social and environmental impact, and ethics and handling of ethical issues. I also added the problems we faced during the project and how we solved them.

Contents

Attestation i

Acknowledgement ii

Letter of Transmittal iii

Evaluation Committee iv

Abstract v

1 Introduction 1

1.1 Overview/Background of the Work 1

1.2 Objectives 1

1.3 Scopes 2

2 Literature Review 3

2.1 Relationship with Undergraduate Studies 3

2.2 Related works 4

3 Project Management & Financing 5

3.1 Work Breakdown Structure 5

3.2 Process/Activity wise Time Distribution 6

3.3 Gantt Chart 6

3.4 Design process duration 7

3.5 Process/Activity wise Resource Allocation 7

3.6 Estimated Costing 8

4 Methodology 9

4.1 Waterfall Methodology: 9

4.2 Why Waterfall Methodology for this project? 10

4.3 UX Design Process and Methodology 10

4.3.1 UX Workflow 11

5 Body of the Project **13**
5.1 Work Description . . . 13
5.2 System Analysis . . . 13
5.2.1 Six Element Analysis . . . 13
5.2.2 Feasibility Analysis . . . 14
5.2.3 Problem Solution Analysis . . . 15
5.2.4 Effect and Constraints Analysis . . . 16
5.3 System Design . . . 17
5.3.1 Rich Picture . . . 17
5.3.2 UML Diagrams . . . 17
5.3.3 Design Workflow . . . 21
5.3.4 Functional and Non-Functional Requirements . . . 26
5.4 Product Features . . . 28
5.4.1 Input . . . 28
5.4.2 Output . . . 30
5.4.3 Architecture . . . 32

6 Results & Analysis **34**
6.1 Overview . . . 34
6.2 Testing . . . 34
6.3 Interview . . . 34

7 Project as Engineering Problem Analysis **35**
7.1 Sustainability of the Project/Work . . . 35
7.2 Social and Environmental Effects and Analysis . . . 35
7.3 Addressing Ethics and Ethical Issues . . . 36

8 Lesson Learned **37**
8.1 Problems Faced During this Period . . . 37
8.2 Solution of those Problems . . . 37

9 Future Work & Conclusion **39**
9.1 Future Works . . . 39
9.2 Conclusion . . . 39

Bibliography **40**

List of Figures

3.1 WBS of Truck Management System 5
3.2 Gantt Chart 6
3.3 Design process duration 7

4.1 Waterfall methodology 9
4.2 UX Design Process and Methodology 10

5.1 Rich Picture 17
5.2 Activity diagram(Customer) 18
5.3 Activity diagram (Partner) 19
5.4 Activity diagram (Admin) 20
5.5 Design workflow 21
5.6 Interview 22
5.7 Interview 22
5.8 Existing workflow 23
5.9 User workflow 23
5.10 Wire-framing for Website 24
5.11 Wire-framing for 'Partner App' 24
5.12 UI design for Website 25
5.13 UI design for 'Partner App' 25
5.14 User test for UX-UI design 26
5.15 User test for UX-UI design 26
5.16 User login 28
5.17 Dashboard 28
5.18 Admin creating trip 29
5.19 Admin creates new trip 29
5.20 Showing trip list for bidding (In partner app) 30
5.21 Placing bid by partner (In partner app) 31
5.22 Trip list for bidding 31
5.23 Bid approving 32

List of Tables

3.1 Activity wise Time Distribution 6
3.2 Estimated Cost 8

Chapter 1

Introduction

1.1 Overview/Background of the Work

It's been a long time since we have started the automation system in Bangladesh in the business area. Like all automation systems, a truck management system is a web and mobile application to manage and operate trucks, covered vans and many more smoothly by managers. This management system is a process that managers manage the vehicle and asset information and driver information from an acquisition to clearance. This automation system enables a company to reduce cost and improve efficiency to ensure compliance with a business operation. Truck management systems maximize efficiency, grow and improve safety and security to management, vans and drivers.

The company 'GIM- Digital Truck' is providing one of the most efficient Digital Freight Network in Bangladesh through its online platforms. Connecting the customers to the transporter through mobile app and web-based services, they are trying to minimize the time gap and maximize the proper utilization of resources. Apart from general customers, small, medium, and large enterprises can also join to connect with transporters and as a transporter to avail the services.

1.2 Objectives

With the rise of automation every industry is moving towards automation and the transportation industry is no different. The main objective of this project is to provide a nice experience to customers while renting trucks and provide an easier way to maintain and process the system. The customer will be able to hire trucks from anywhere without going to the truck-stands. There are options to choose a truck among the vast categories which are time saving, easy and convenient. The truck owner will be able to get more trips by sitting at their workplace and earn more with minimum efforts.

1.3 Scopes

The company currently has three application for smartphone user. The customer app, partner app and Internal app. The scope of the project is the following scenarios I will be working which is basically for partner app of the company:

- Placing bid by partner/ truck owner.
- Receive pending trip list in admin.
- Accept or Reject bid from bid list.
- Payment by online.
- Receive invoice for the completed trips.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

CEN 401 - Database Management: In this course, we were taught how to plan a project from scratch and complete the project. Six Element Analysis, Problem Analysis, System Development Life Cycle, Rich Picture, Requirement Analysis, Entity Relationship Diagram, Business Process Model, Normalization, and creating and maintaining databases using PHP, MySQL, Apache Server, Xampp were covered. These techniques helped develop the strategy of the "Truck Management System".

CEN 203 - Data Structure: In this course, we were taught the basic concepts of many data structures and their applications, such as the Stack, Queue, Linked List, Array, Pointer, Nested arrays, Nested objects etc.

CEN 305 - Object-Oriented Programming: In this course we were taught how to represent data and objects and use modular programming to reduce repetition and long lines on codes. This course is a deep dive into classes and its objects of programming. It helped to design our project code in a modular format.

CEN 405 - System Analysis and Design: In this course, we were introduced to the tools and techniques for the design and analysis[1] of information systems. Topics covered include Systems and models, Project management, Tools for determining system requirements, data flow diagrams, decision table and decision trees, Systems analysis, systems development life cycle models, Object-oriented analysis, use-case modeling, United Modeling Language, Feasibility analysis, Structured analysis, systems prototyping, system design design and implementation, application architecture, user interface design[2] [3], Front-end[4] and back-end design, database design, software management and hardware selection, Case studies of Information Systems as well as how to apply them to a project.

2.2 Related works

Truck rental system is necessary nowadays in the modern area as it has eased the overall transportation system for hiring and renting. As we can see there are global and local markets of this product where we can analyze the overall features and functionalities and get an idea to implement the project.

The following are some of the related works:

Truck Lagbe: They started their journey by 36 trucks but now it is total more than 50,000 trucks all over the country. Now they have a big three storeyed office in Dhaka. In September, 2018, they have launched the mobile app.

Shohoz Truck: It is founded in 2014. It is very easy process to book a truck by Shohoz Truck website or App and you will be matched with the closest available truck. They have more than 2000 truck owners.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

The whole work scope of a project is organized and divided using a project work breakdown structure (WBS), which is a graphical depiction of a deliverable or product-oriented grouping of project work elements. Work breakdown structure (WBS) is a technique that defines a plan. Its conception and implementation should be given thorough thought and planning to reduce the need for additional revisions. Major changes to a WBS require a large investment of time and resources due to its applicability to a variety of project activities. It is important to distinguish project WBS, which are determined by the scope of a project, from other applications of WBS-like systems.

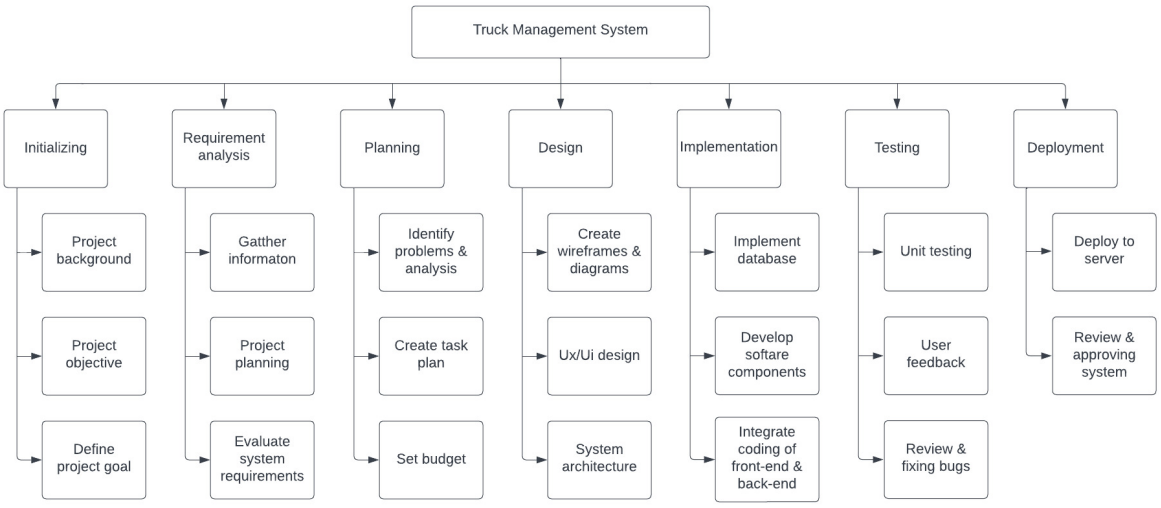


Figure 3.1: WBS of Truck Management System

3.2 Process/Activity wise Time Distribution

The time allocation for the 3 months project is shown on a table. For each part shown in the WBS. Diagram above, we allocated a certain amount of time, as required to complete the tasks. The Table below shows them in detail.

Task	Days	Work percentage (%)
Initializing	9	10%
Requirement analysis	9	8.3%
Planning	10	11.7%
Design	20	16.7%
Implementation	30	33.3%
Testing	7	11.7%
Deployment	5	8.3%
Total	***90 Days***	***100%***

Table 3.1: Activity wise Time Distribution

3.3 Gantt Chart

To complete the project successfully we planned and scheduled the activities using Gantt Chart. Gantt charts will be used in this project for the purpose of planning and scheduling project activities over a period of time. Gantt charts are also able to show us additional information regarding the different tasks or sections of a project, such as how far have tasks progresses, how a group of tasks might depend on, determining the resources required, and planning the sequence.

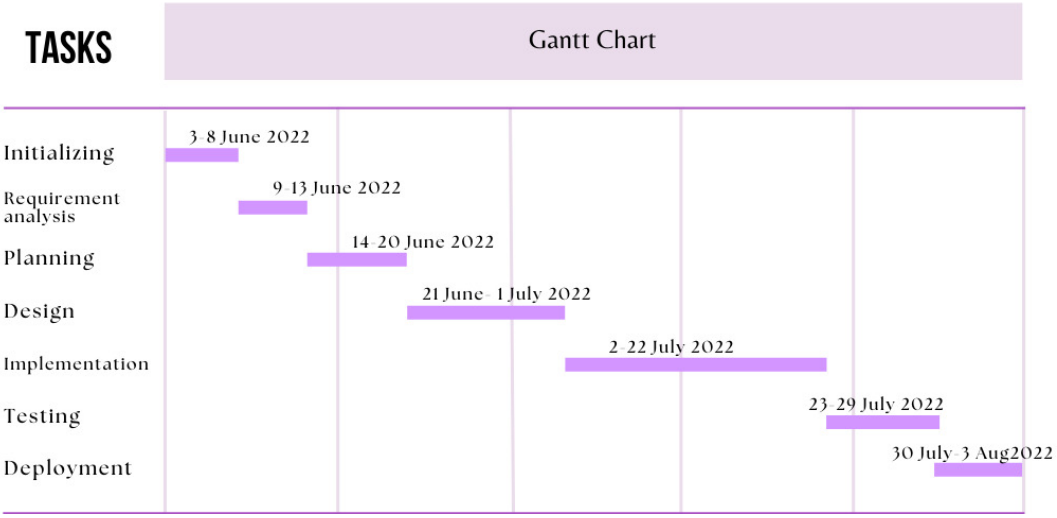


Figure 3.2: Gantt Chart

3.4 Design process duration

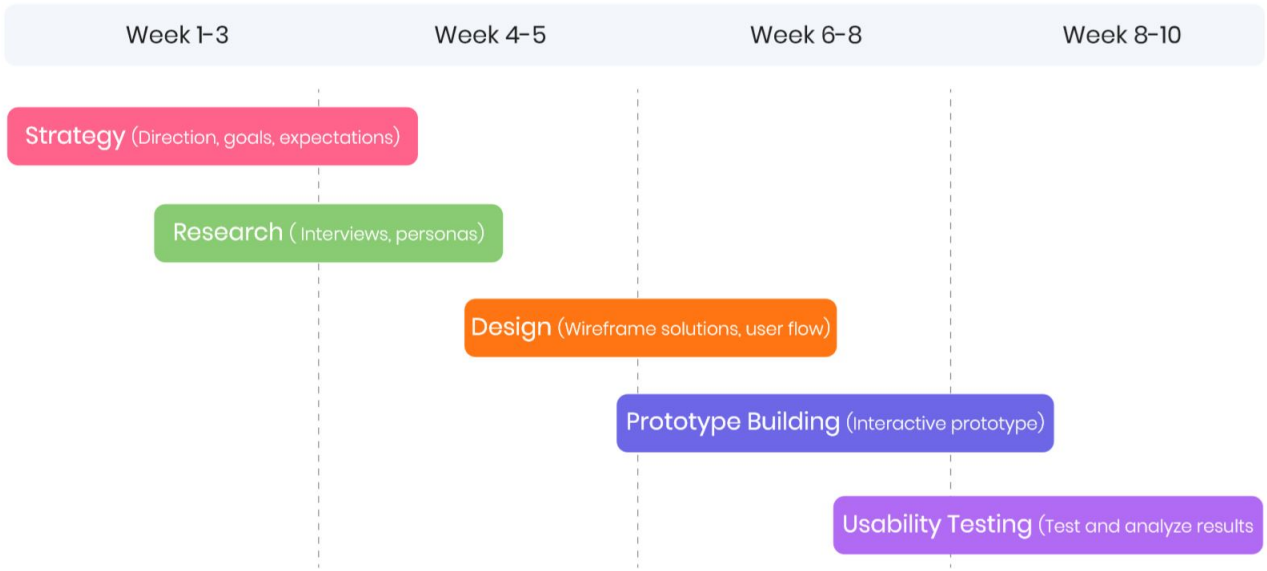


Figure 3.3: Design process duration

3.5 Process/Activity wise Resource Allocation

Truck management system is used mainly by the users who need a truck for transporting goods, renting etc. from the system. The backbone of a project management is resources. Thus for achieving this all the resources required were allocated for the development and implementation of the project. It was very important for me to allocate every resource needed for the project to fit in its position. So, resource allocation became an important focus. The activity wise resource allocation of this project are detailed below:

- Initializing: This is the first step of the development. Here a few ideas were proposed by several truck owner truck management systems and we planned for a generic product. Sometimes when a problem arise, we note down and taken to the supervisor for more discussion.
- Requirement Analysis: This is the initial step in the development of a project. The requirement analysis team gathers information from sources and sets the predictions of what the requirement for the web and application.
- Planning: The next phase is developing a plan with directions. All the team employees were involved and brainstormed on how we are going to set goals and the approaches we are going to take to develop the web and application.

- Design: The designing phase is where UI/UX designers designed the features using Figma Software. They provide the front-end developers the guideline in developing the website and application[5]. They provide few diagrams of users and functionality of the system to make it more clear.

- Implementation: At this stage, the developer team members were assigned to their part of the development. The senior developers are tasked with dividing the work among their subordinates. The developers have a weekly target to meet. Developers started working on writing the code for the front-end and back-end of the application by the instructions that were given by designers.

- Testing: Testing phase started as soon as a feature was added to the site. The errors were being fixed as we were also developing new features in the application. The QA team checks for any bugs and reports back to the developers for correction. When the QA team is satisfied with the project they take random feedback from users.

- Deployment: After successful feedback session, the project is finally made live and deployed into the live server. Though the development process ends here, the website might face bugs in the live server after deployment and they fix those right away.

3.6 Estimated Costing

The costs were calculated based on the features required for 'GIM- Goods In Motion' company to operate and establish online operations. As a continually used web and application, it would have costs to keep running as well. Estimates of these costs are given below:

Requirements (monthly)	**Amount**
Project management	50,000
Design	70,000
Development	80,000
Maintenance	5,000
Total	**205,000**

Table 3.2: Estimated Cost

Chapter 4

Methodology

4.1 Waterfall Methodology:

Waterfall is ideal for projects like software development, where the end result is clearly established before starting, and is best suited for projects that require a lot of predictability. It has a fixed timeline and budget because the project goals are specific and delineated from the start. Once the goal of the project is established, the Waterfall methodology does not involve frequent feedback or collaboration from the client, apart from established milestones or deliverable for each phase. This makes it easier for project managers to plan and communicate with stakeholders or business partners. However, while this can help with planning, it is also only practical when a client has a clear and fixed end goal and does not need to be involved in the process of the project's development.

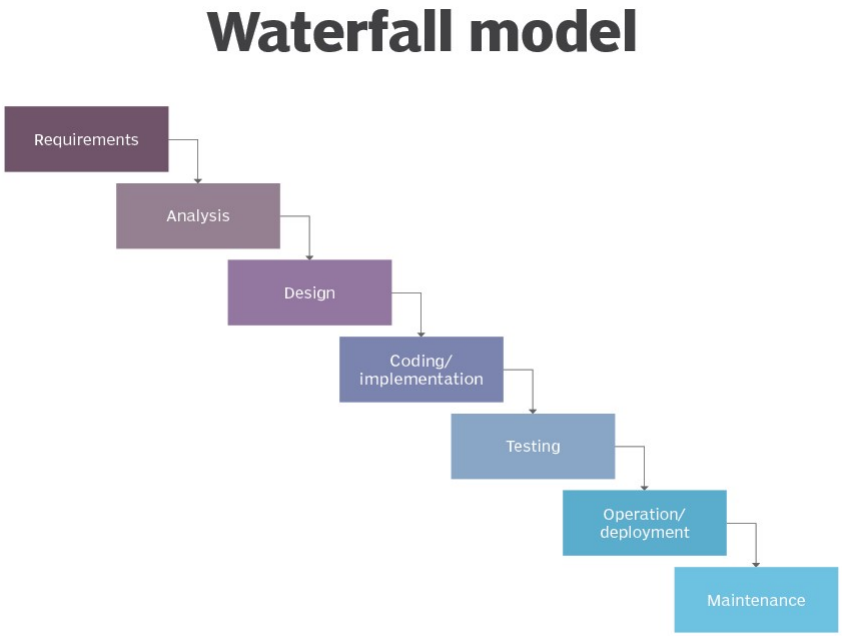


Figure 4.1: Waterfall methodology

4.2 Why Waterfall Methodology for this project?

In this management system, before beginning the implementation process, it is necessary to assess and design the entire project. Each sector will be considered throughout the analysis phase, and the clients will approve the design. The project will next progress to the implementation phase, which is the most significant component of the whole project, and then it will be ready for testing. Testing allows for the identification and correction of current bugs and modifying any additional requirements from the clients. After the entire process is completed, the project will then be ready for deployment and proper management. Since the phases are rigid and precise, one phase is done one at a time, it is easy to maintain.

4.3 UX Design Process and Methodology

I went through these processes for UX/UI designing to complete the project.

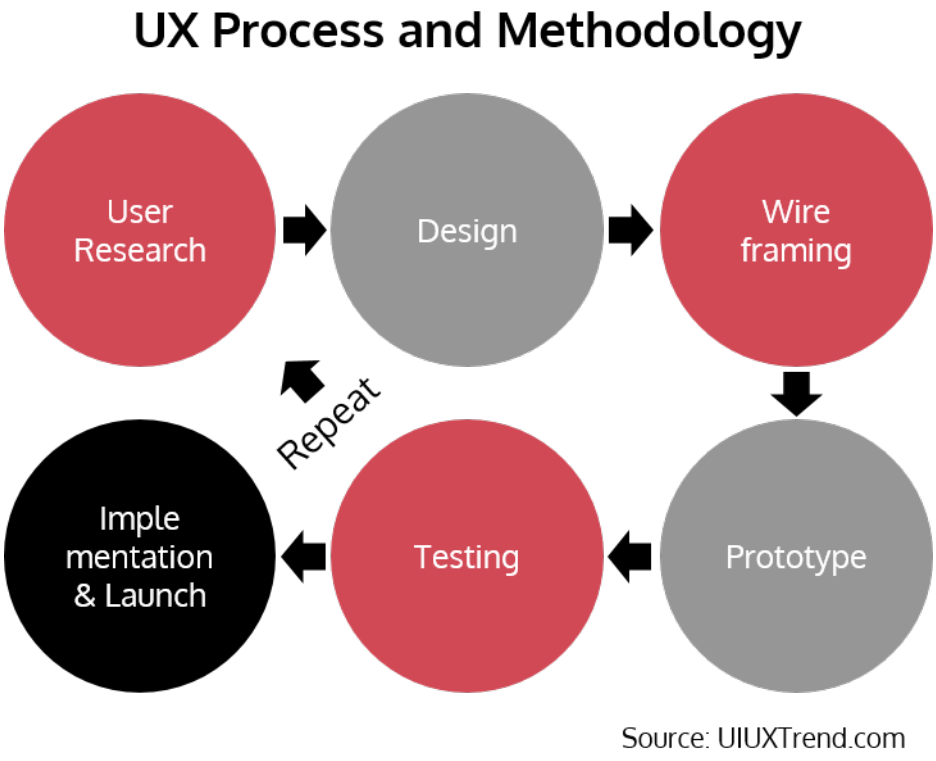


Figure 4.2: UX Design Process and Methodology

4.3.1 UX Workflow

1. Defining the business need:

- Project scope
- Project road map
- Time-frame and deadlines
- Tasks and objectives
- User data and analytics
- Financial and technical constraints
- Stakeholders, roles and responsibilities

2. Conducting Research and Gaining Insights research methods will include:

- General user research
- Conducting interviews
- User focus groups
- Surveys
- Competitor research
- Market research

3. Analyze Research and Ideate:

- User personas
- Empathy and journey maps
- User problems and pain points
- Where competitors win and fail
- Business value opportunities

Teams can ideate to develop solutions with a clear picture of the users, market, problems, and business value opportunities. It's a collaborative brainstorming exercise often involving stakeholders from several departments like the product, marketing, and engineering to get diverse ideas and perspectives.

4. User Flows

Using research results, UX designers begin listing and organizing the screens they'll need to design. Using these lists, we can create the information architecture or sitemap to define user flows and navigation.

5. Low-fidelity Prototyping and Creating Information Architecture

With information architecture, the low-fidelity prototype should be defined. Paper prototyping is a collaborative effort where UX designers gather to simulate different user flows and identify the elements and components the product will need.

Create digital wire-frames and low-fidelity prototypes using a design tool. These lo-fi digital prototypes use simple click/tap interactions to test navigation and user flows.

6. Testing

We've put testing at step six in this UX workflow, but ultimately, designers begin testing from the very beginning. They might not always test with participants, but designers will constantly experiment to validate ideas and concepts. But the most critical testing happens once design teams have working prototypes. Late usability testing with end-users produces meaningful feedback for designers to make changes, test, and iterate until the product is error-free and working as intended.

7. Design Hand off

Product designers, UX teams, and engineers meet periodically throughout the project to ensure designs meet technical constraints and designers document their work correctly. Designers will share a link to the final prototype.

Chapter 5

Body of the Project

5.1 Work Description

The company 'GIM- Digital Truck' is providing one of the most efficient Digital Freight Network in Bangladesh through its online platforms. Their target is to connect the customers to the transporter through mobile apps and web-based services. The service provides a nice experience to customers while renting trucks and provides an easier way to maintain and process the system. As a tech intern at 'GIM- Digital Truck' during this time, I contribute to the front-end development and ux/ui designing. The front-end is built with Angular framework Html5, Css, JavaScript, jQuery and Bootstrap5, Typescript and Flatter. For the back-end, we have used Framework of Java language, Spring, Spring boot, Hibernate and Python. The database functions using MySQL. On the other hand, we have used 'Figma' for overall ux/ui designing.

5.2 System Analysis

5.2.1 Six Element Analysis

The 'Six-element' analysis method based on social network is proposed in this paper, namely, a variety of sub-networks are constructed according to the correlation among the six elements—people, organization, time, location, manner and event.

Process	Six Element Analysis					
	Human	**Non-computing hardware**	**Computing hardware**	**Software**	**Database**	**Communication and network**
Login	Customer/ Partner/ Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet
Creating trip	Customer/ Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet
Placing bid	Partner /Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet
Tracking truck	Customer/ Partner/ Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet
Payment	Customer/ Partner/ Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet
Invoice	Partner/ Admin	N/A	Computer/ Smartphone	Web browser/ App	MySQL	Internet

Six Element Analysis Table

5.2.2 Feasibility Analysis

A feasibility study is necessary for determining the project's feasibility as quickly as possible. Months or years of effort, large sums of money, and most importantly, massive professional embarrassment can be averted if an ill-conceived system is recognized early in the definition phase. The analysis of a proposed project to determine whether it is feasible and should go ahead is called feasibility analysis. Confirmation of design, plan and strategy is the main priority of this analysis. This can be used to validate assumptions, constraints, decisions and approaches.[6] There are three types of feasibility analysis: Technical feasibility, Operational feasibility and Economic feasibility.

- **Technical feasibility:** A technical feasibility study assists organizations in determining if they have the necessary technical resources to develop the concept into an effective, fully operational system. It aids in project troubleshooting before work

is started. The analysis identifies potential difficulties and reveals solutions for them. It can act as a flowchart for how goods and services develop before they are introduced to the market, which is helpful for long-term planning. Technical Feasibility deals with the hardware as well as software requirements. Technology is not a constraint to type system development. We must find out whether the necessary technology and the proposed equipment together have the capacity to hold the data, which is used in the project, should be checked to carry out this technical feasibility.

- **Operational feasibility:** It refers to the measure of solving problems with the help of a new proposed system. If the software for a new system is too difficult to use, employees may make too many errors and avoid using it. Thus, it would fail to show operational feasibility. It helps in taking advantage of the opportunities and fulfills the requirements as identified during the development of the project. This feasibility is dependent on human resources and involves visualizing whether the software will operate after it is developed and be operative once it is installed. It is dependant on human resources available for the project and involves projecting whether the system will be used if it is developed and implemented.

- **Economic feasibility:** Economic feasibility analysis is the process of determining whether a new venture is worth the cost and time investment. It is also known as cost benefit analysis. This kind of analysis takes into consideration the cost of both developing and operating the new venture. A wide array of factors is considered, and if they show that the idea is cost effective, then it typically will be adopted. It will reduce the costs of wasting human energy, pens and papers. Overall, an analysis typically will explore whether there is a demand for the things that a new venture would provide, particularly if it is a product or service for sale.

5.2.3 Problem Solution Analysis

Requirements are constantly changing is one of the biggest issues a web developer has to cope with during the web development process. In order to analyze a problem, it is necessary to first identify the main issue and then determine its sources and effects. During this project, we have faced some problems that are stated below:

- One of the major problems that a web developer has to deal with during the web development process is that the requirements are always changing. The solution is before development we had to set a meeting all together for confirmation.

- During this project, git integration caused some unexpected issues in maintaining the branches etc.

- In this project for most of the address features Google Map API service was used. We have faced some issues regarding the sequence of API calls.

- As technology advances, being in today's world where everyone is attached to their smartphones. Keeping up with market trends is the solution here.

5.2.4 Effect and Constraints Analysis

- **Time:** Time strictly depends on the company's project budget. Sometimes the company faces financial difficulties and wishes to revive its operations as soon as possible. Here, the effect of time happens sometimes.

- **Budget:** One of the organization's most important constraints is its budget. Whenever the budget fails the project works can not be up-to the mark. For some softwares, a certain amount of money has to be spent on the hosting, domain, etc. However, sometimes high paid personnel were laid off and replaced by fresh inexperienced developers throughout the development of our product due to financial constraints imposed during budget failure with happens because of effect of budget.

5.3 System Design

5.3.1 Rich Picture

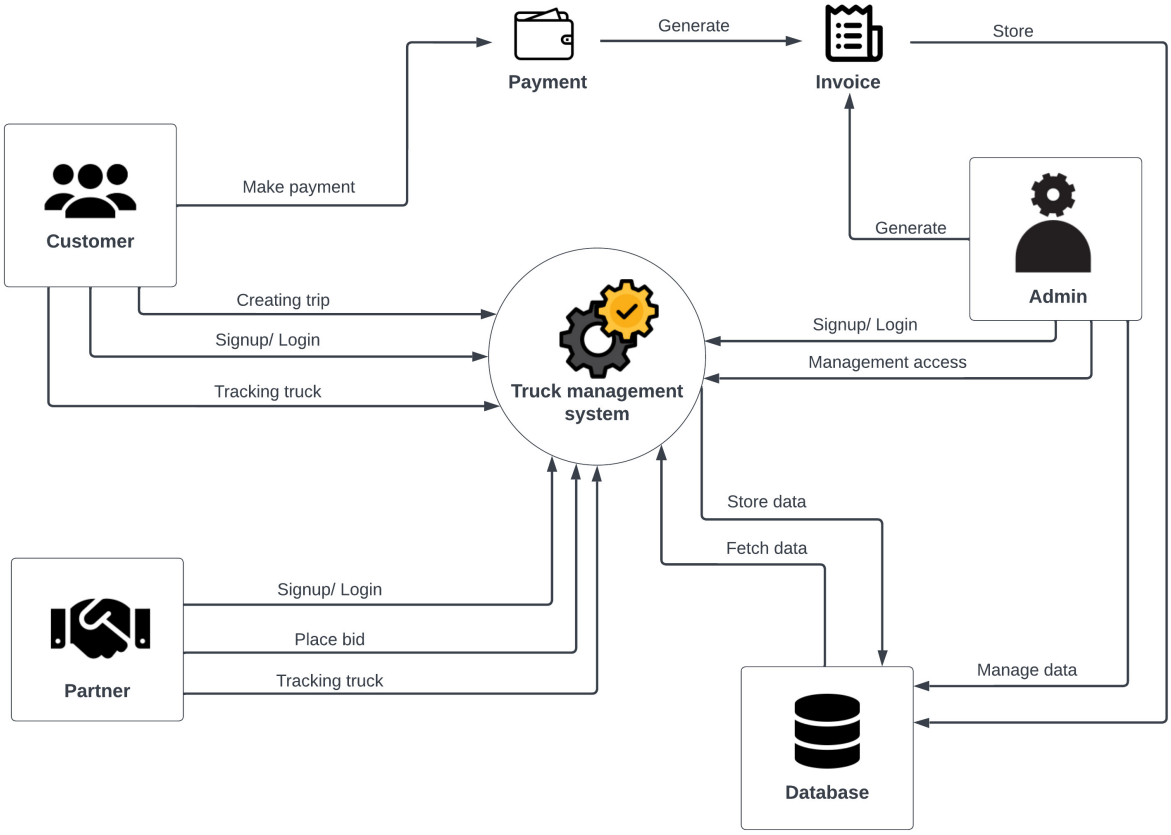


Figure 5.1: Rich Picture

5.3.2 UML Diagrams

Activity diagram: An activity diagram visually presents a series of actions or flow of control in a system similar to a flowchart or a data flow diagram. A common tool in business process modeling is the activity diagram. Additionally, they can outline the procedures in a use case diagram. Activities might be sequential or concurrent while being modeled.

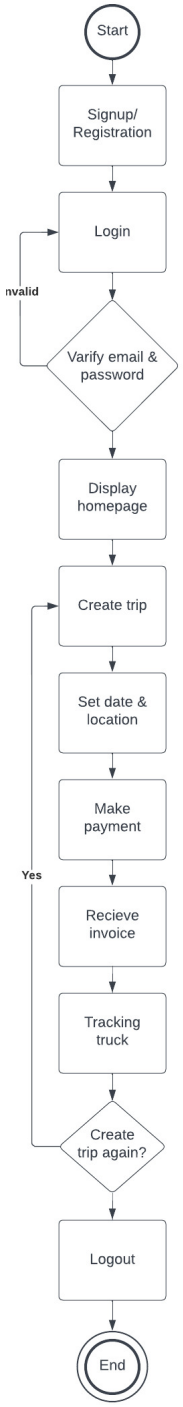


Figure 5.2: Activity diagram(Customer)

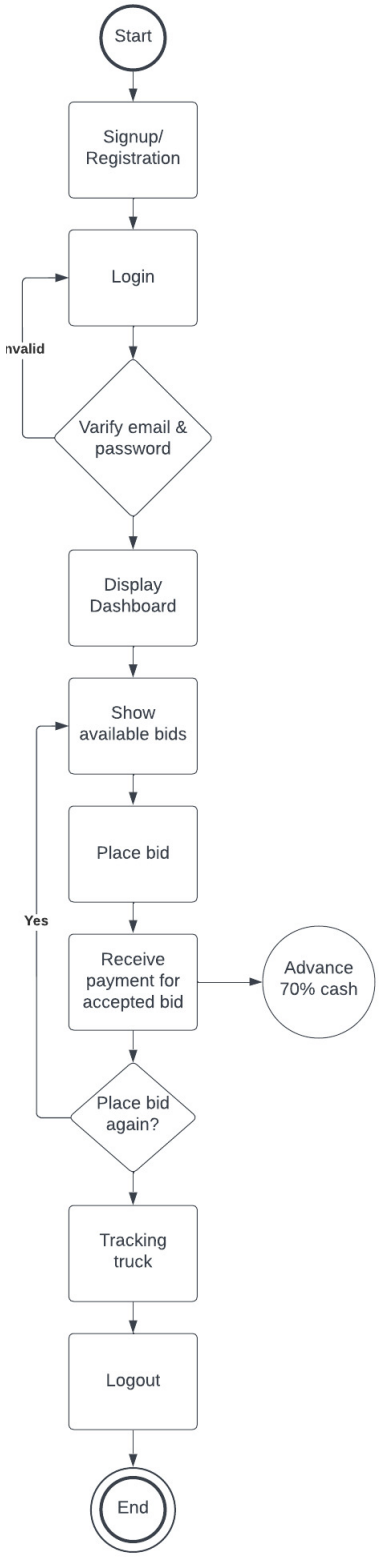


Figure 5.3: Activity diagram (Partner)

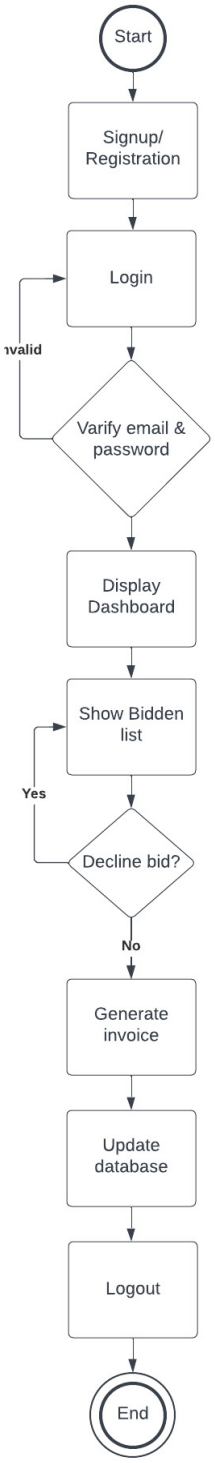


Figure 5.4: Activity diagram (Admin)

5.3.3 Design Workflow

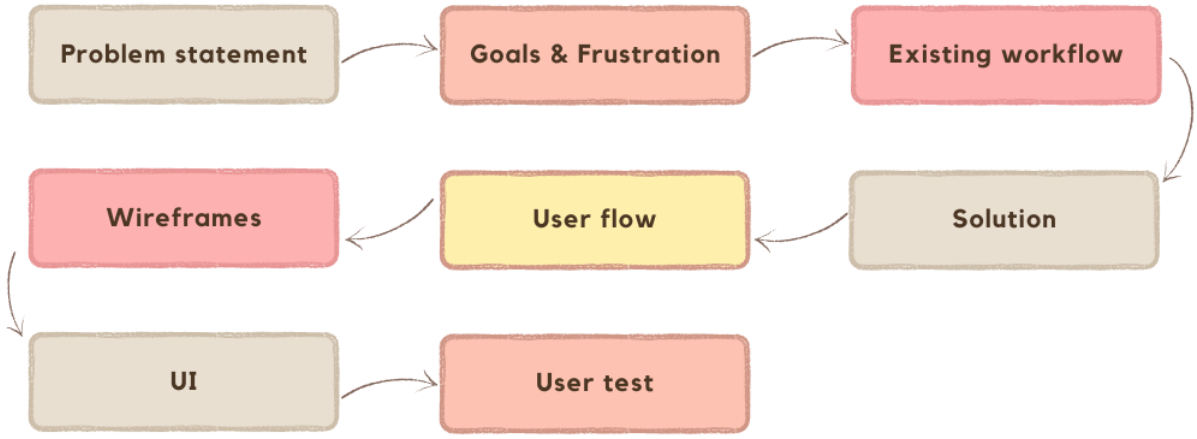


Figure 5.5: Design workflow

Problem Statement

After creating a trip, it goes directly to the admin and they accept or reject it as a partner's preference by calling over the phone. It is a great hassle and time consuming to call partners one by one to receive their preferable rate to confirm a trip.

User Persona

Goals:

Confirming a trip in a short time after a trip is created by the customer.

Frustration:

Wasting so much time to call each and every partner which is a lengthy and time consuming process.

Interview:

Key Stakeholder: Admin of Management team

Interviewee: Mr. Jahangir, Admin of Management Team **Date:** 07/06/2022 **Time:** 10:30 AM **Place:** GIM company **Subject:** Current process of confirming trip		
Time Allocated	**Interviewer Question or Objective**	**Interviewee Response**
3 min.	**Objective** Open the interview: • Introduce ourselves to each other. • Thank Mr. Jahangir for giving us his valuable time. • Clearly state the purpose of the interview to obtain an understanding of the process.	
3 min	**Question 1** What is the procedure through you confirm a trip from customer?	After creating a trip by a customer, it goes directly to the admin panel and then we call partners from our partner list as needed. Then we decide to take one rate and confirm the trip.
3 min	**Question 2** What time does it take to call a partner and talk about trip?	Depends on preferable rate. Normally takes 3-4 min.
2 min	**Question 3** Is there any other way to let the partner know about available trips?	Yes, in partner app they can see the available trips.
3 min	**Question 4** Do you think starting a trip by this process wastes a lot of time?	Yes, it does.

Figure 5.6: Interview

3 min	**Question 5** What time does it look for a preferable partner to start a trip?	It depends on partner's preferable rate. If the rate is not up to the market rate, you have to call other partners as well to confirm the trip.
5 min	**Question 6** Do you think calling partners one by one is annoying for each trip?	Yes. It is.
2 min	**Question 7** Do you think an automation of this system will reduce your pain?	Yes, of course. I think it will save lot of time too.
1 min	**Objective** Conclude the interview: • Thank Mr. Jahangir for his time and cooperation and let him know that he will receive a copy of the interview.	
25 min	Time allotted for questions and objectives	
5 mins	Time allotted for follow-up questions and redirection	
30 mins	Total time allotted for interview (10:30 AM – 11:00 AM)	
General Comments and Notes:		

Figure 5.7: Interview

Existing workflow

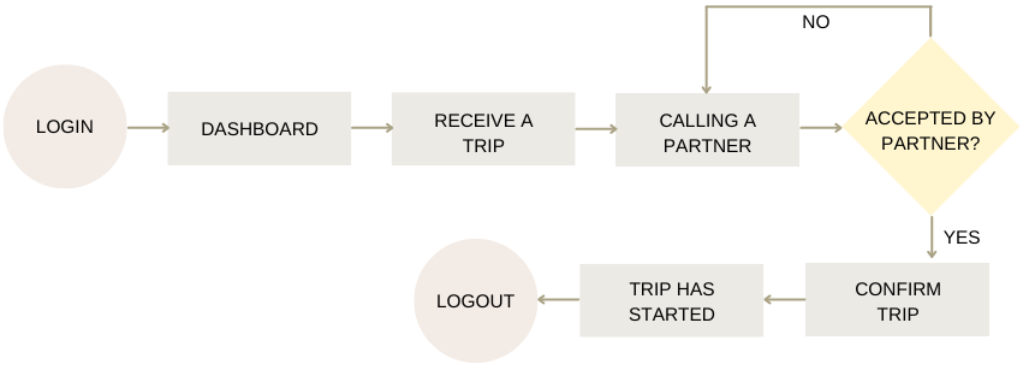


Figure 5.8: Existing workflow

Solution

We have added a different feature for partner app named 'Bidding'. After a trip is created by a customer, all partners can bid as their preferable amount for a selected trip. After bidding, the admin can accept or reject as per company's instructions without any hassle and saves a lot of time.

User workflow

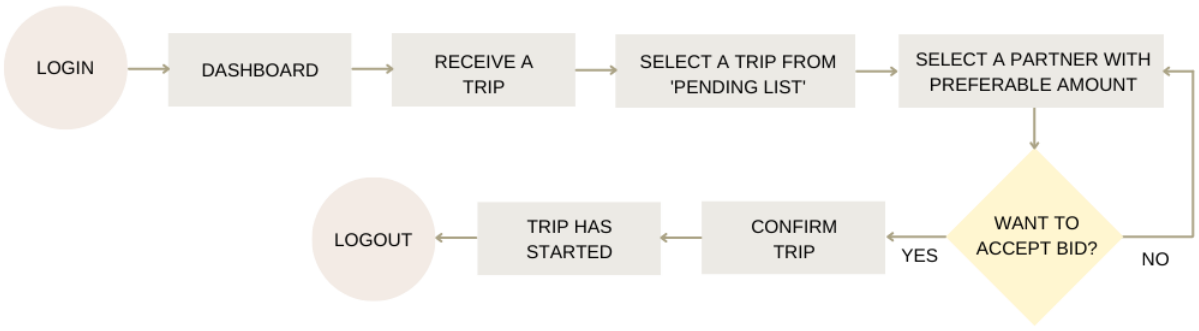


Figure 5.9: User workflow

Wire-frames

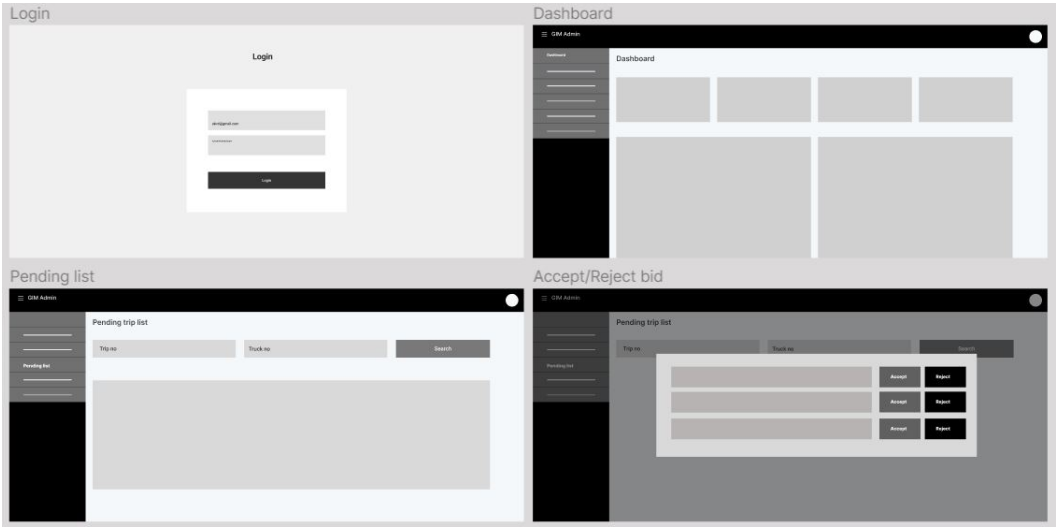


Figure 5.10: Wire-framing for Website

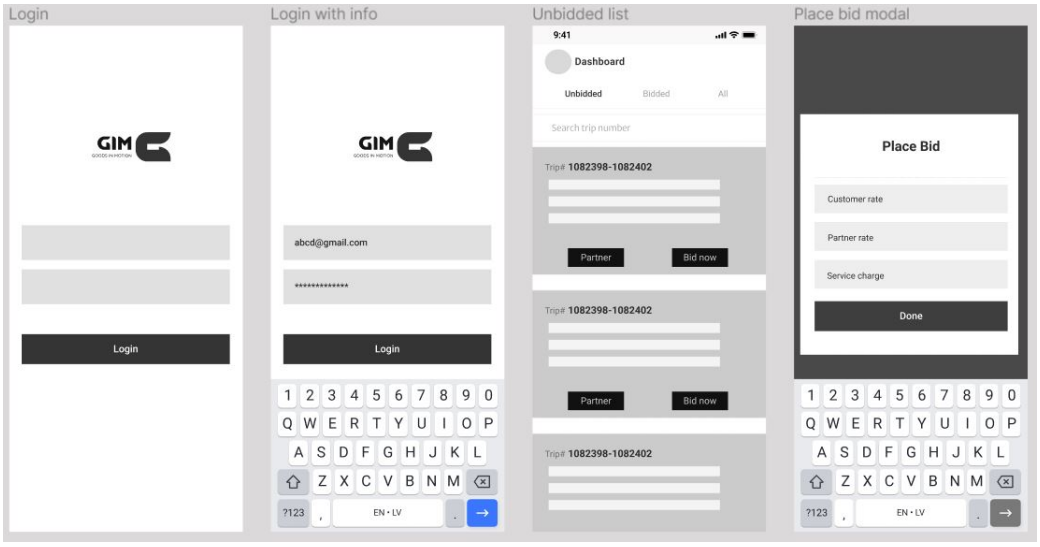


Figure 5.11: Wire-framing for 'Partner App'

UI design

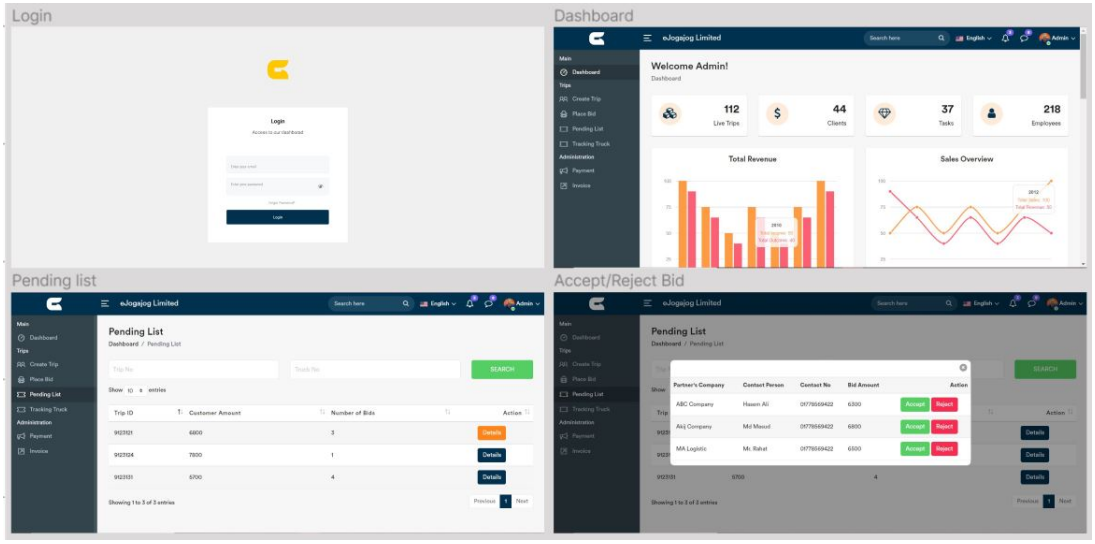


Figure 5.12: UI design for Website

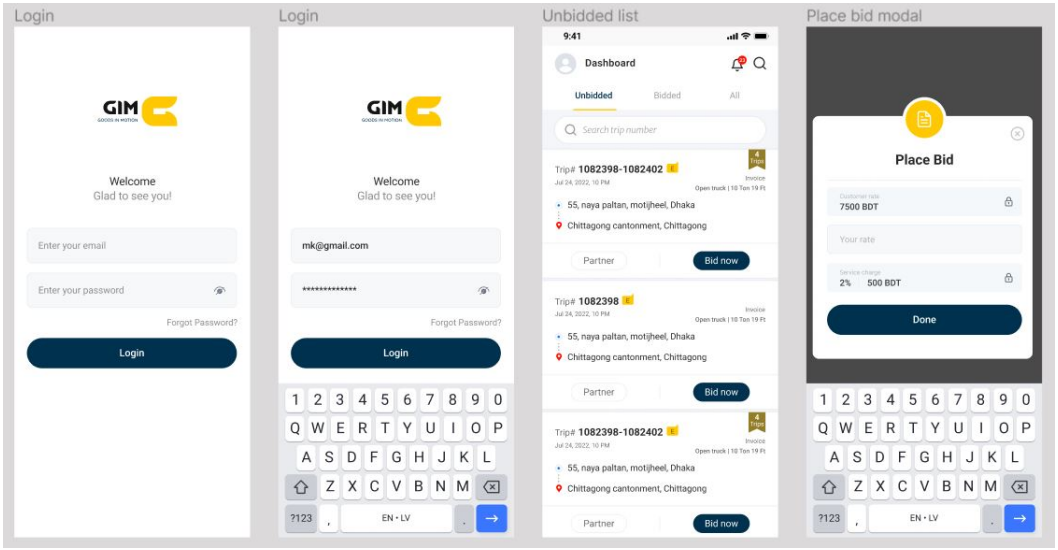


Figure 5.13: UI design for 'Partner App'

User Test Interview

Name	Coloured UI	Remarkes	Background color	Remarkes	Minimalist UI	Remarkes
Amir	1			location is not visible & 'bid now' button seems not pressable (button is not available).		without background color the area
Tanim	1					
Manee	1					
Ahanab	1					
Tushor	1					
Victor	1					
Mahin			1			
Akash		too much informations and lines. company logo is more eye catching than locations	1			
Nafia		too crowdy	1			
Sadia		colors are vibrant, too much colors & not eye soothing.	1			
Muhaymin	1			button can be colored (not focused)		
Al Amin	1			location can be more focused		
Fida		too crowdy and colors. (we cant use any company logo)	1	need more info. 'Trip number' should be less focused (such as can be used at a upper corner) and can be used as "Trip no". 'bid now' button seems less visible.		

Figure 5.14: User test for UX-UI design

Name	Pref 1	Remarks	Pref 2	Remarks	Pref 3	Remarks
Nafia	1				1	
Akash	1	repeatation of truck type, goods type	1			
Tanim	1			dont like the individual save system		
Saiful	1	* If I only want 5 feet open truck, (dont want to add size) what will be the result?			1	adding + icon for front page so that I can understand I have to add/ tap here
		* If I want open truck 5 feet truck only for route of rajhsahi to khulna? how can I know the connection between these two? same goes for goods type.				I like this one for adding individual option for saving. (such as if I only want route, not truck type and goods type)
		I like the idea of being in one page so that I can see everything at the same time				
Mithun	1	* As a truck driver user, the font can be bigger and more vibrant color can be used.				
		* truck picture or truck icon can be used in 'truck type' options so that user can understand the difference among trucks.				

Figure 5.15: User test for UX-UI design

5.3.4 Functional and Non-Functional Requirements

Functional Requirements:

- Registration: Users can register through the system.

- Login: User can login and authentication of the system validates the entered email upon receiving the information and logs into the web and app.
- Dashboard: The system will let customers, partners and admin enter the dashboard after login. The dashboard has many features which can be seen by all of the users as needed.
- Creating trip: Admin and customer can create trip through website and mobile apps. Admin can also talk directly to customers and create trips for them as their preference.
- Placing bid: When a customer creates a trip, partner and admin receives those trip lists and partner can place bids as their preference to start the trip.
- Tracking truck: After trip confirmation the user can track trucks through the web and app.
- Payment: Customers can pay online by clicking the payment option after confirmation.
- Receiving invoice: User will receive an invoice instantly which will be generated by the admin and will be stored in the database of the system.

Non-functional Requirements:

- Scalability: The system is accessible from any devices like computers, smartphones etc with internet connection availability.
- Usability: The system is made user friendly and designed to be an easy to use interface for the customers, partners and admins.
- Security: All information and data on the server is secured. Only the admins will have access to all of the functions and core code.
- Maintenance: This system goes under maintenance once a year for smooth functioning.
- Performance: The system's performance has smooth functioning with a secured data storage facility. It is expected to have acceptable throughput and response time without lagging.
- Service: Users can access the system from anywhere in the world. If any problem occurs they can easily get help from the help center.

5.4 Product Features

5.4.1 Input

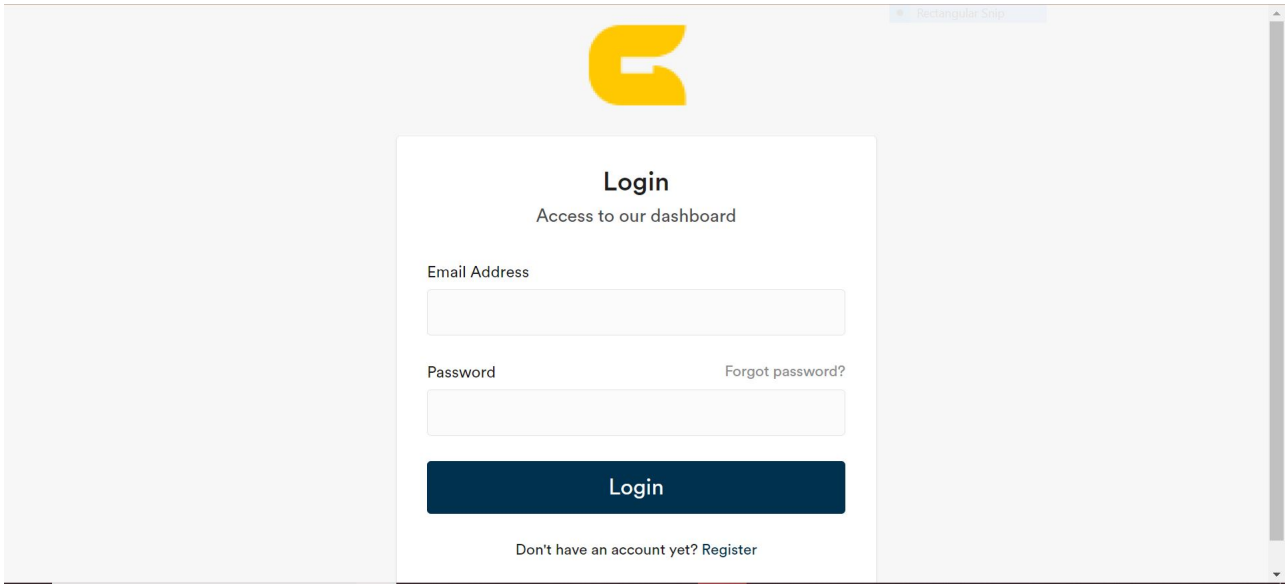


Figure 5.16: User login

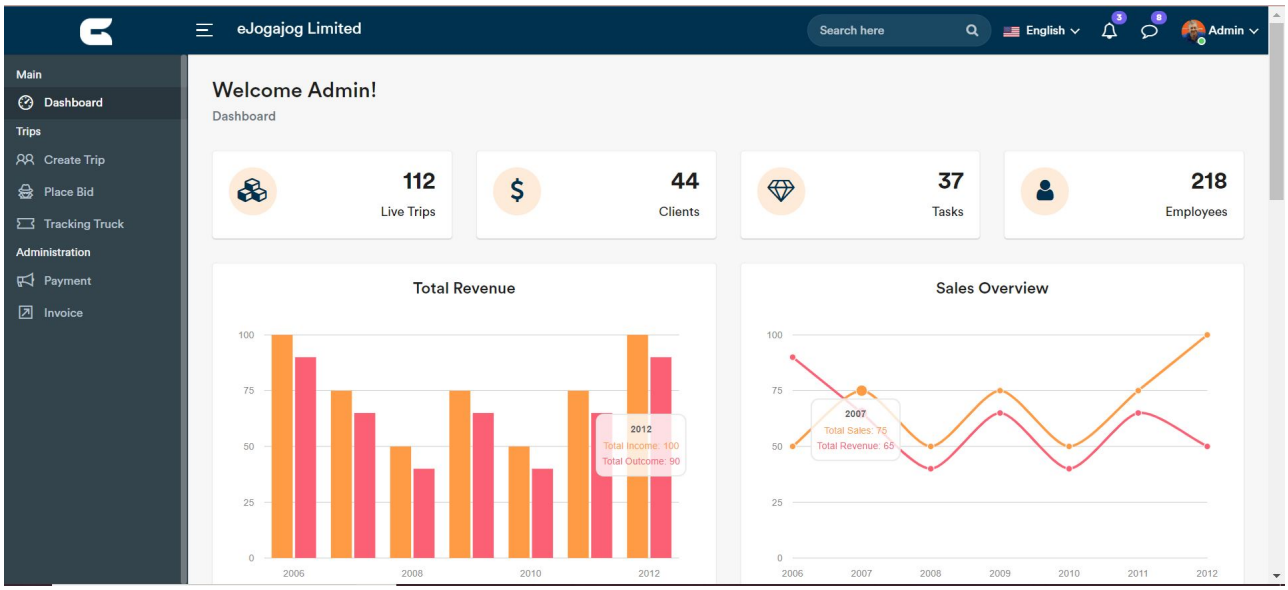


Figure 5.17: Dashboard

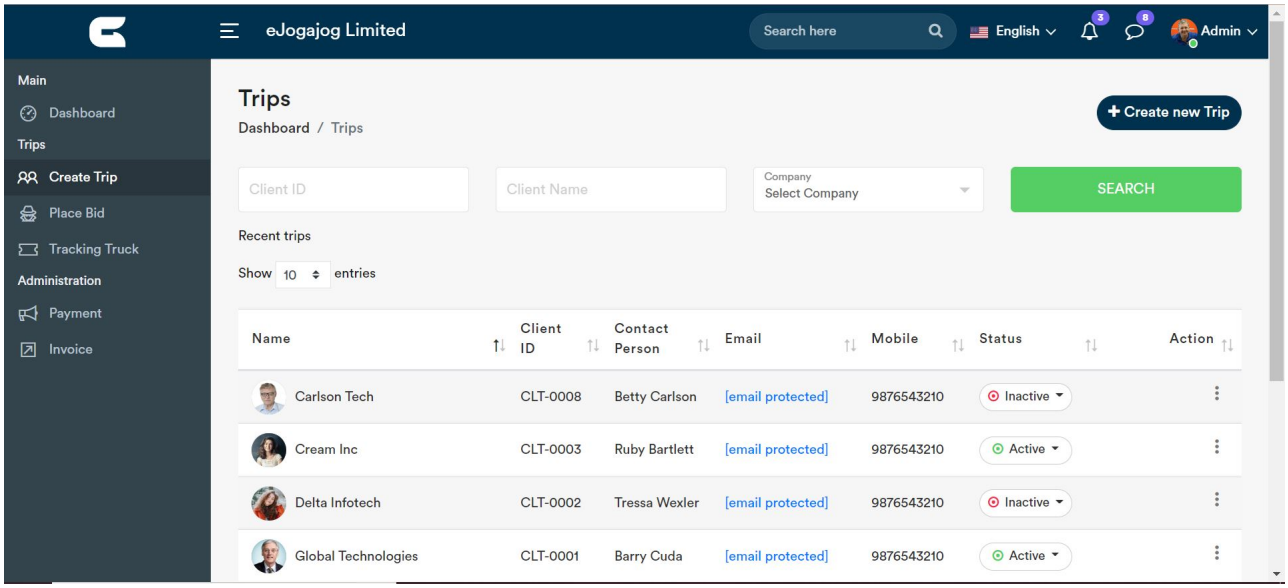


Figure 5.18: Admin creating trip

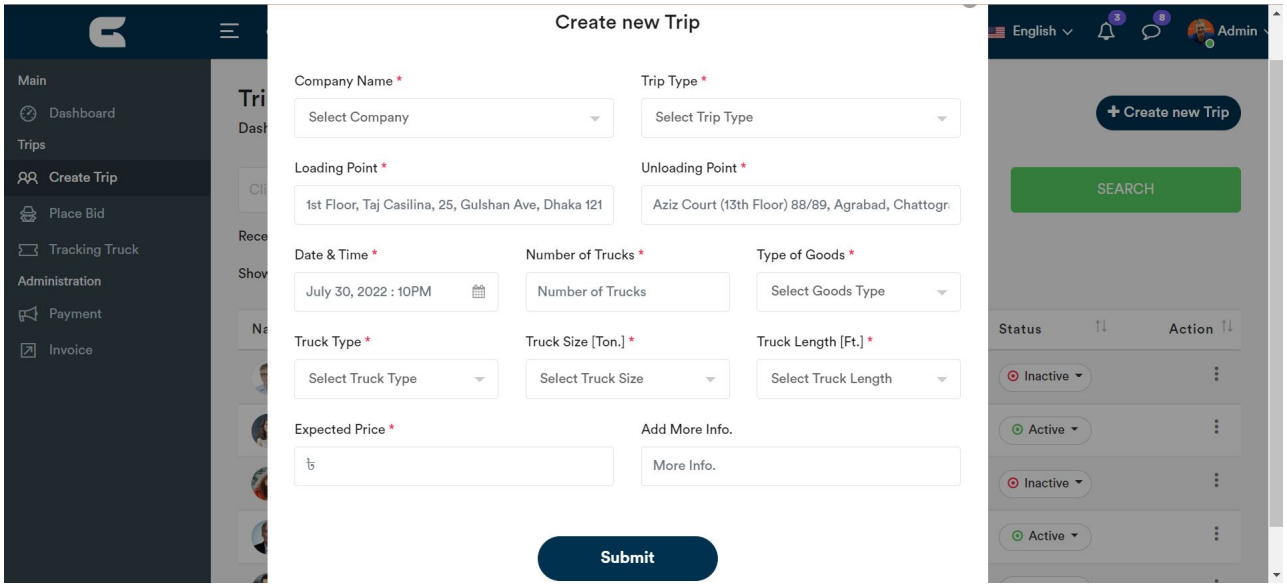


Figure 5.19: Admin creates new trip

5.4.2 Output

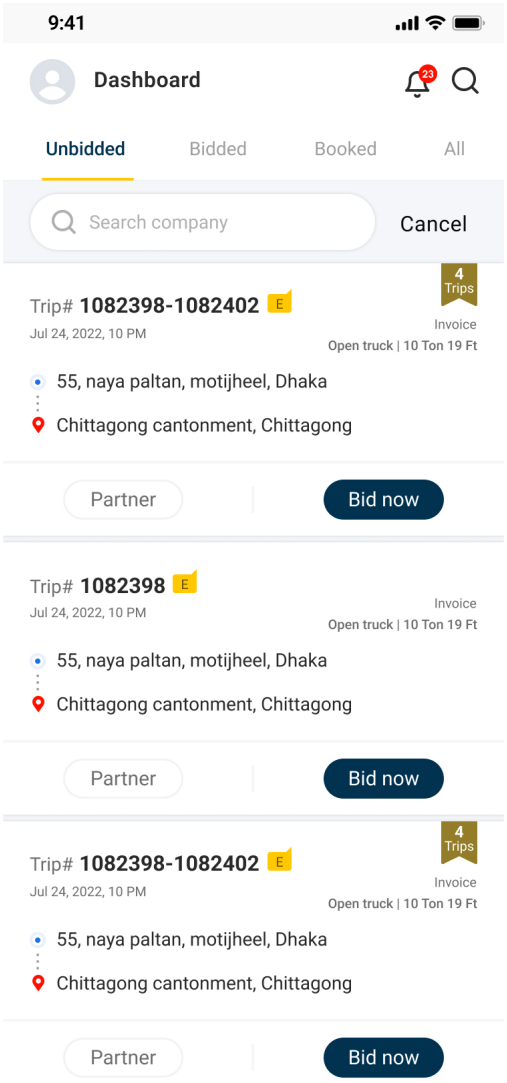


Figure 5.20: Showing trip list for bidding (In partner app)

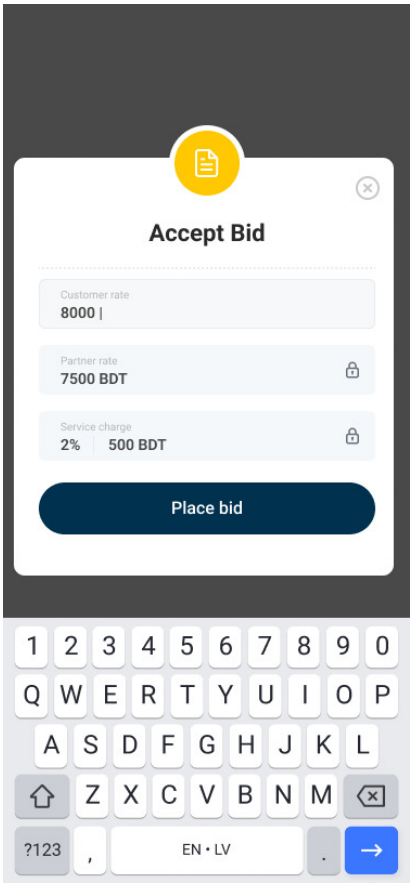


Figure 5.21: Placing bid by partner (In partner app)

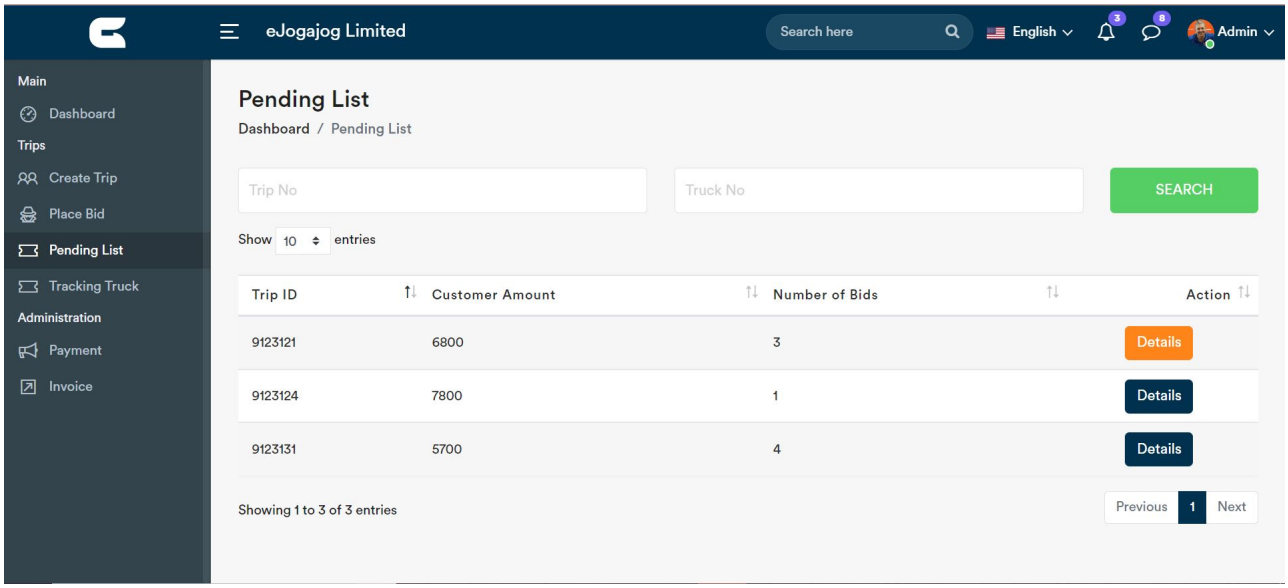


Figure 5.22: Trip list for bidding

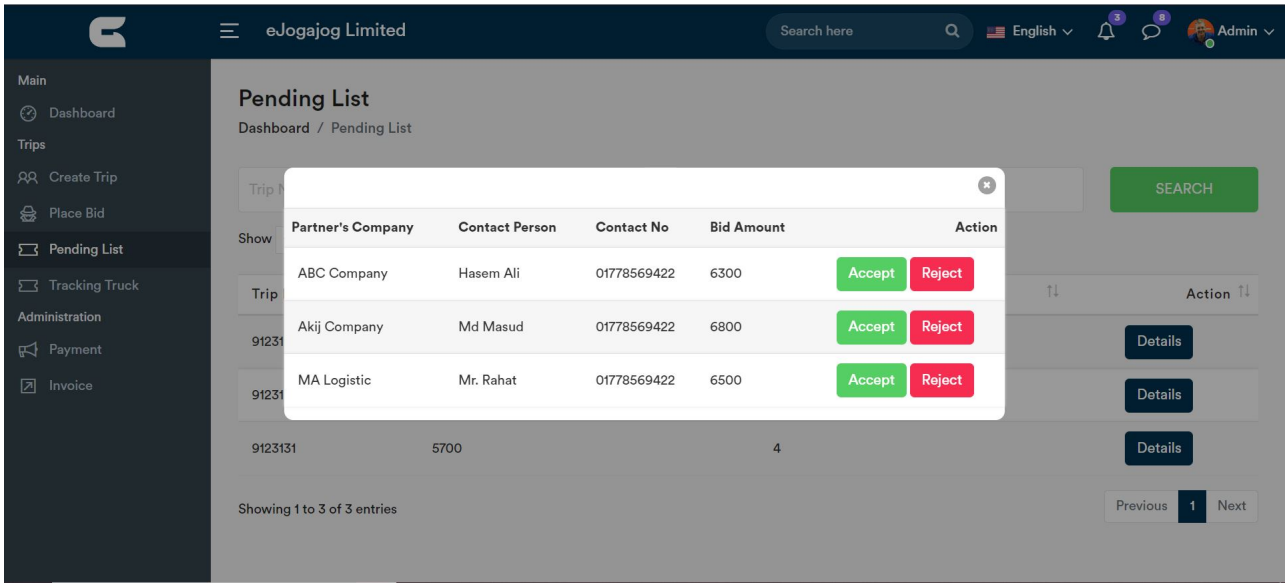


Figure 5.23: Bid approving

5.4.3 Architecture

The framework of any construction is defined by its architecture. A website's architecture establishes the framework for how the website will function, how data will be transported, and where it will be stored. A web application is commonly structured as a some application which refers to the design and implementation of front-end, back-end and database processes. We have chosen many web based applications for our project overall.

Ux/Ui Design: In this project for designing we have used the application Figma[7] mainly. The wire-frames, UX, UI everything has been done accordingly [8]. Besides that, we have also used Adobe XD, Illustrator, Photoshop etc. for other designs.

Front-end: For the front-end decoration of this system built with Angular framework Html5, Css, JavaScript, jQuery and Bootstrap5, Typescript and Flatter. Bootstrap5 is used to make the page more responsive and to create dynamic layouts for websites and web applications. JavaScript runs interactive web pages effectively[9]. Simple HTML, CSS and JavaScript are used for the front-end decoration in this system[10].

Back-end: PHP is used in full back-end to run the system smoothly as it is reliable. PHP is a widely used open-source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. We have used it for this project because it has more resources, extensions, and plugins that are relevant to our

project. In the back-end portion of the project, we have used Framework of Java language, Spring, Spring boot, Hibernate and Python all together.

Database: The database is connected to our front-end in this project. It is the most widely used application for the management of MySQL databases. Using this software, we can create, update, drop, alter, delete, import, and export MySQL database tables among other things.

Chapter 6

Results & Analysis

6.1 Overview

We follow some steps to gather required requirements for the project at first. The web development team sits for a meeting with other teams to discuss the company's requirements. Whenever a general idea of the project was developed, we had to conduct a survey to make a clear idea of the functionalities. Another interview session was held to determine the system interface, the technology to use, and the data required. Ultimately, the prototype came with all the assemblies found through interviews and research.

6.2 Testing

Any problems that arise during the test are immediately resolved by the developers. Testing yielded finding my own bugs, feelings of failure and inadequacy and eventually solutions to those bugs. After completing all tests, a beta version would be released. From the test case table, we can see that some of the test cases failed to pass. After the completion of the these process, the team will make sure to prepare documentation for the test cases, documentation for the defects in order to explain the complicated tasks.

6.3 Interview

After completing all testing processes, the product team goes for an interview session with the trial version of the system. Simple questions such as what the user really wants, how to make the application more user friendly etc. and note down everything. After this session the project might be updated as per needed.

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

Sustainability is the ability to exist and develop without depleting natural resources for the future which enables an organization to attract employees, shareholders and customers who are invested in the goals of sustainability and share these values. The impact of sustainability can therefore be positive for a business' image as well as revenue. Development of long-term software is much needed for a company to create a better future. The company 'GIM- Goods In Motion' ensures that their applications must be maintained, bug-free seamless user interaction and regularly updated for the benefit of its vast users. To make the program more durable, regular system maintenance is performed from time to time.

7.2 Social and Environmental Effects and Analysis

Social Effects: General users can easily hire a truck or van for their daily needs through our app at home. Usually they had to go outside which is hasselful. Besides that, truck owners also can rent their trucks online worry free. The platform facilitated the employee's duty, while also allowing customers and partners to simplify their hasselful work with much easier life which impacts on social effect .

Environmental Effects: All administrative works and customer services are offered online and data is maintained in a database. The general public does not have to leave their houses for rent or hire a truck, which reduces the number of individuals outside of the house. The system eliminates the need for paper records and conducts all other activities without relying on hard copy documents. As a result, the immediate surroundings will remain environment friendly which also has a positive impact on the environment.

7.3 Addressing Ethics and Ethical Issues

There are several standards and ethical guidelines that must be followed when designing software to protect the website. The GIM company's data is securely stored in the database that is only accessible to administrators. They are allowed to manage other users' accounts, gaining access to the server and deleting user data where employees can only update or add data through the website. This way, the information kept can be considered safe and secure. Even every user's password will be encrypted so that the admin cannot know the password. Only users can change their password and access to their pages.

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

Collecting data: Collecting data lists from drivers and partners of distance traveled was not so easy. I also faced problems while implementing functions in the project work.

Testing: There was no resolute testing team. Hence the testing had to be done by the product team. As a result, both the designing team and development team works remotely as needed for testing.

Server: After the project's development, there was confusion about whether the team had to go with a shared hosting server or a dedicated hosting server. The servers would have worked, but shared hosting has a scalability issue.

Debugging errors: One of the most significant challenges for me was figuring out how to detect and debug errors in code written in a new language. Adapting to new syntax and keywords was quite tricky. It took me a great deal of trial and error before I could find the solution I needed.

8.2 Solution of those Problems

Collecting data: For collecting data and information, we keep every information into a new excel sheet and organize them according to our database. Then we give input from excel to our database which saves our time much more.

Testing: As we already work both the designing team and development team remotely as needed for testing, later we also hired a professional hand during the testing phase as needed.

Server: For server, shared and dedicated both servers have worked but due to scalability issues we choose to host on a dedicated server.

Debugging errors: Allotted additional time for learning and acclimating to the new language and kept debugging the errors without becoming demotivated is another challenge we have solved during these periods.

Chapter 9

Future Work & Conclusion

9.1 Future Works

Our company aims to provide the best user experience possible while using the system we have created. We regularly examine our systems to see what modifications are necessary to enhance and optimize them. The development of a mobile app was one of the most challenging projects for us and we constantly update and add features as needed. The user will find it more simpler to use the system and receive service easily.

9.2 Conclusion

This report is based on the "GIM- Digital Truck" project where the report provides all of the project's certain requirements and designs. The project took about three months to complete, and everyone in the team and co-workers were really helpful. I had a great time working as an intern at the "GIM" Company. During my internship, I acquired experience working in a corporate setting, learned a new programming language, and also studied UX/UI design. I worked together with my mentors and seniors on my project to solve challenges. Despite having hectic schedules, my mentors and supervisors were always there to help me adjust and answer any issues. I've gotten better at meeting deadlines and working under pressure. The time period I spent in the company was truly an opportunity to have great experience.

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An Undergraduate Internship/Project on Truck Management System

By

Ayesha Binte Mustafa

Student ID: **1821588**

Summer, 2022

Consent Form

The student modified the internship final report as per the recommendations made by his/her academic supervisor and/or panel members during final viva, and the department can use this version for archiving.

Asayed

(Signature of the Supervisor)

Md Abu Sayed, Lecturer

Department of Computer Science & Engineering
Independent University, Bangladesh