An Undergraduate Internship on Edison Real Estate

By

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Science in Computer Science

Department of Computer Science & Engineering

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Attestation

This is to certify that the report titled "Edison Real Estate" was completed by Md. Rafsan Al Azim (ID-1630707) submitted in partial fulfillment of the requirement for the Degree of Computer Science from Independent University, Bangladesh (IUB). It has been completed under the guidance of Md. Noor Nabi (Internal Supervisor) and Anjan Das (External Supervisor). I also certify that all my work is original and has not been submitted earlier to this university or any other institution. All the sources of information used in this Project Report has been duly acknowledged in it.

Signature: ....   Date: ………………………….

Md Rafsan Al Azim

Acknowledgement

Letter of Transmittal

January, 2021

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Subject: Report submission of the internship

Dear Sir,

With due respect and honor, I would like to submit my report of Internship for the completion of my Bachelor of Computer Science and Engineering degree. I prepared this report based on my internship experience in Dcastalia Ltd starting from 1st of February, 2021 till date. I was assigned in the development team as a Frontend Developer intern. I successfully served my internship period in Dcastalia Ltd.

In Dcastalia I worked under the supervision of Mr. Anjan Das, Head of Development. This report is based on my project in Dcastalia. I was assigned with the project Edison Real Estate website, where I worked as the frontend developer with the team. My experience in Dcastalia was great. The main objective of the internship is to learn and gain knowledge and enhance our skills and get the first taste of the corporate world, which I believe I have achieved by working here. I would also like to thank you Sir, for your continuous support and guidance which helped me to complete the project.

I pray and hope this report will be informative and fulfil your expectations. I have tried my best to avoid my deficiencies and hope that my report will be of satisfactory standard. I would also like to thank you again for giving me the opportunity to submit this report.

Sincerely,

Md Rafsan Al Azim

Id – 1630707

Evaluation Committee

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Supervisor

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Convener

Abstract

Bangladesh has been evolving as a digital nation where we have a very high number of people using internet and the number keeps rising. Internet is easy to get now and has reached every corner of the country. This also demands business, different platforms, organization to evolve and get digitalized. This opens a huge opportunity for business organization to promote themselves online. Like every other business sector, Real Estate business have also taken this opportunity to grow their business and reach more people. Dcastalia has partnered with lot of prominent real estate companies to help them make their online platform to promote their business and increase the brand value. The following report is based on the development of such a company's website, Edison Real Estate. The website aims to help their customers and interested buyers with important information, easy solution to contact or book a meeting and also promote the brand to the local community to establish them as one of the prominent Real Estate agency.

The report also describes my internship experience with Dcastalia Ltd, a well-known digital agency based in Dhaka, Bangladesh. Dcastalia was found back in 2009 and since then serving their customers with their expertise. I am glad to join them and work with them in the development team as a front-end developer intern.

The report is divided into 8 major parts explaining the project and the process of the development. It starts with the introduction of the project in the first chapter focusing on the overview and the objective of the project and the scopes of work we had. The second chapter is about the literature review where I covered how the project is related with my bachelor's degree. In the third chapter, project management and finance, I covered the planning that went into the project which includes breakdown of time, resources and cost to carry on the development. Then on the fourth chapter, the methodology that is followed for the project is described and how that methodology helped us in planning and development. The firth chapter titled body of the project, in fact is the most important part of the report. Here the system analysis is discussed with thorough discussion on different techniques of analysis and diagrams. The next chapter, Results and analysis, covers the result we obtained after the development and analyzed what we achieved. Chapter seven is the discussion on the sustainability of the project, social and environmental effects and the Ethical aspects. Finally, in the last chapter, along with the conclusion of the report, I discussed the scope of future works.

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Chapter – 1: Introduction

1.1 Background of the Work

We, people of Bangladesh are on the era of digitalization and adopting new technologies and systems. In the span of last 10 years, we have become heavily dependent on the internet for our day to day lives. Using this opportunity every business is trying to make their mark on the internet and making their business more available online. We are seeing the blooming growth of e-services and marketplaces on the internet. We have seen the rise of many e-commerce and online business which includes different types of good, consumables, services, properties etc.

The concept of searching for properties and houses on the internet is relevantly new for the people of Bangladesh. But in this era of digitalization where people are more dependent on the internet to search for their needs, real estate business are also ensuring their presence on the internet to be found by its customer with ease.

The need for housing is increasing day by day in our society as urbanization is spreading throughout the country. People now a days have shifted from the conventional way of searching and adopted towards newer system and technologies. Edison Real Estate saw this opportunity to build an establishment for online connection with potential clients to promote and sell items and services. Showcasing their products and services would also help their investors to make a decision on whether they find them suitable and trustworthy to make an investment or not.

Edison Real Estate sought the help of Team Dcastalia to make a website for their real estate business to ensure strong presence on the internet. Through their website they wanted to showcase their projects in a beautiful organized way for their visitors. The visitors would be able to select a project from the list of projects on display which are shown with photos. All the detailed necessary informations related to the selected project will be displayed to the visitor. A detailed view of the project will be catered for the visitors through photos and videos which will give them a good idea on the project without even visiting the location physically. The visitors will also be able to contact with Edison Real Estate in case they want any further details through a contact form.

1.2 Objectives

The main objective of the project is to reach more clients and investors through their online presence which will also provide the visitors an easy solution for communication through the web platform. Given the current pandemic situation of Bangladesh and also the traffic condition in Dhaka, moving from one place to another has become very challenging and time-consuming task. It has also become difficult for people who are interested in buying properties to travel from location to location and find their desired properties. As a solution the website of Edison Real Estate would serve the purpose of making peoples life easier and finding their desired properties online.

Through this website people will be able to find their desired properties according to their likings using various search filters. This website will also allow users to get all the necessary informations regarding a specific property without the hassle of visiting the location physically.

The website is designed with good concepts of UI/UX in mind. The User Interface is designed to give the website a premium yet user friendly look. The concepts of User Experience are also taken into account while designing to give its user a good experience. The website is also made seamlessly accessible through mobile devices, which gives the advantage for its user to browse through the website on the got at any time.

1.3 Scopes

i. **Landing Page** – The index page of the website where users will get a summary of the full website.
ii. **About Page** – A detailed page to highlight on who Edison Real Estate are.
iii. **Project Page** – Display of all the projects that are owned by Edison Real Estate with detailed information and pictures. Projects are also divided into 3 categories: Ongoing, Upcoming and Completed projects.
iv. **Service Page** – A page for the information that are required for the investors.
v. **Career Page** – Will show the job vacancies of Edison Real Estate and interested candidates can apply by filling up and submitting the form.
vi. **Contact Pages** – Dedicated contact page and contact form for general visitors, potential customers and potential investors.

Chapter – 2: Literature Review

2.1 Relationship with Undergraduate Studies

CSE 213, Object-oriented Programming: Through this course I learnt the concept of treating data as an object and also modular code structure which made codes shorter but more efficient. The concept of using functions and class was very helpful and was widely used in my project.

CSE 303, Database Management: This was a basic core course which focused on teaching us how to plan and design a project. In this course I learnt the basics of a database and how it works, database languages, Rich Picture, ER Model, Converting ERD-Relations, Introduction to Normalization and Structured Query Language. All these knowledges were useful while I designed and planned the project. Knowledges of MySQL, PHP and use of local server was also useful in my project to make it dynamic.

CSE 307, System Analysis and Design: This course gave a brief idea on Software Development Life Cycle which helped me to plan all the steps and phases of the project. It helped me to identify the goals and challenges. Through the 7 stages if SDLC analysis we formed a plan which made the work easier for me and the whole team at Dcastalia.

CSE 307, Web Application and Internet: This was the most important course for my project where the course covered the important parts of developing a web application. Here I learnt HTML, CSS, Js, Jq, PHP, MySQL etc. which was directly implemented in my project.

2.2 Related Works

Real Estate and Properties business on the internet is not a brand-new idea, rather it's a very common thing to portray this business online worldwide. But for Bangladesh the idea is relatively new and business owners now a days are more inclined towards marking their online presence.

Dcastalia has worked previously with many Real Estate and Properties business companies to cater their need of a strong online presence on the internet and create a way of smooth communication with its customer. Some of the highlighted projects are:

i. **Concord**: Their website was designed to incorporate all the aspects of their services on one platform: Concord is one of the oldest and well-known real estate companies who have big projects like Sriti Shoudho under their belt. Their website consists of a great UI and UX to effortlessly reach their virtual client.

ii. **Shanta Holdings Limited:** Shanta Holdings is one of the most renowned names in the field of commerce and industry and is one of the prestigious and leading construction companies of Bangladesh today. Their site portrays the genuine personality of the organization.

iii. **Rangs Properties**: Rangs properties is a luxury real estate company. Their premium website allows users to properly engage with the brand and determine everything they need to know about the company and their services.
iv. **BTI Brokerage**: BTI brokerage sister concern of BTI Group which has been one of the leading real estate companies for the last four decades. Their website was designed to incorporate all the aspects of their services on one platform.

Chapter – 3: Project Management & Financing

3.1 Work Breakdown Structure

Work Breakdown Structure is defined as a deliverable-oriented hierarchical decomposition of the work to be executed by the project team to accomplish the project objectives and create the required deliverables. It organizes and defines the total scope of the project. [1] We have also created a WBS so that our project is managed smoothly and more efficiently in an organized way. We have used a top-down approach to produce our WBS and a phase based WBS.

The 5 elements in our Level 1 and how the phases are followed is described briefly below:

i. **Requirement Analysis:** Clients Requirement is taken and accordingly a sitemap is produced. Project timeline is produced, risk factors are analyzed and costing is estimated

ii. **Design Layout:** Through various techniques of system analysis the design layout is produced like, UML diagram, Rich Picture and Activity diagrams. Then User interface is designed based on the analysis.

iii. **Development:** Starts with the front-end development and proceeds to backend development. Both the developments start with separate development meetings and then followed by different phases which includes number of audits to ensure quality, making the site mobile response, CMS setup and versioning, data entry etc.

iv. **User Acceptance Testing (UAT):** This phase starts when the site is functional and the site is taken through testing and fixing and showed to the client to obtain their feedback and further revisions are done.

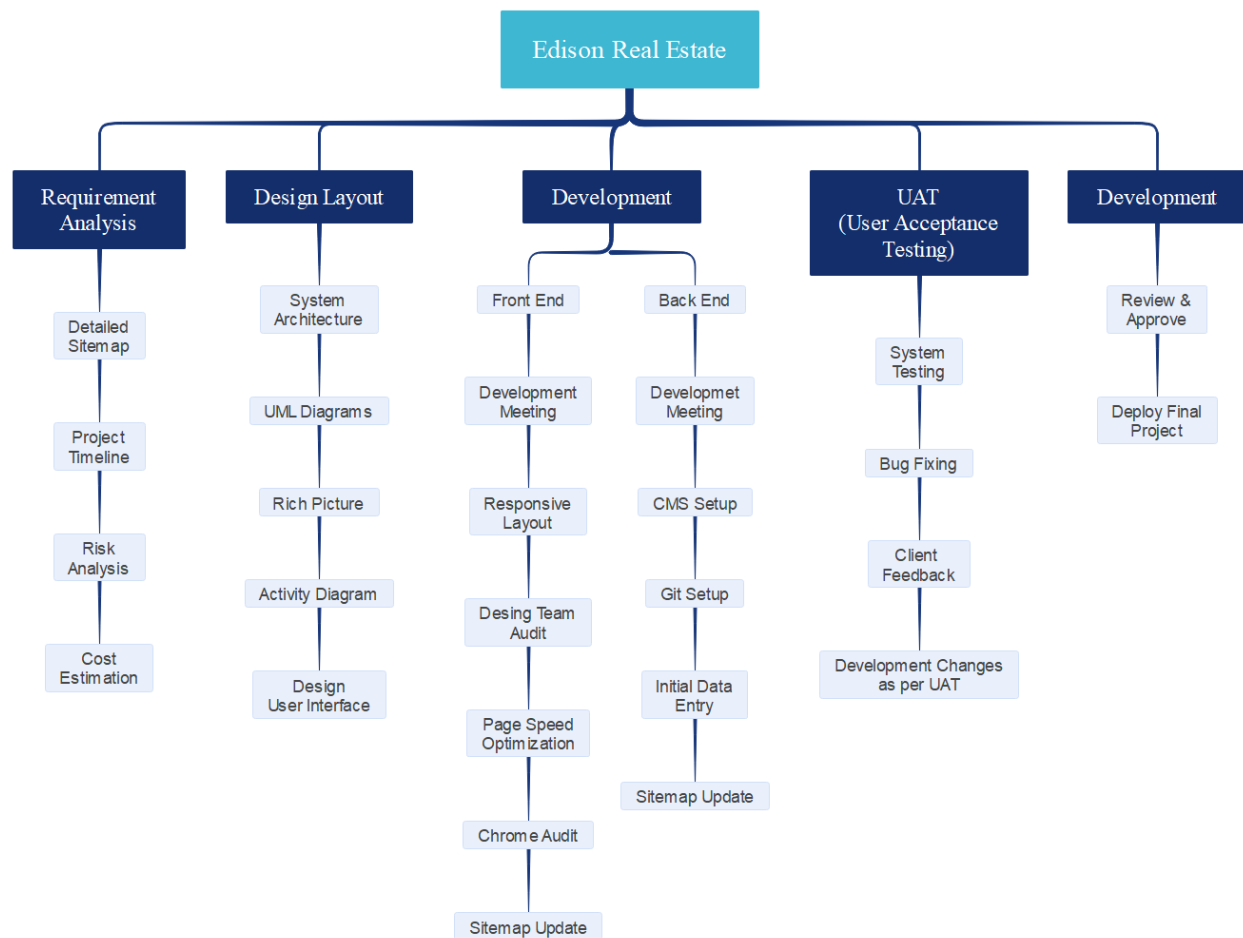v. **Development:** In this final stage upon client approval the site goes live.

Figure 1: Work Breakdown Structure (WBS)

3.2 Process/Activity wise Time Distribution

According to our WBS, we produced a table to demonstrate ideally what percentage of work should be completed in given time. The total time estimated for the project completion was 60 days. The total task is divided into 5 major tasks which sums up to 100% of the total work. The five major tasks are:

i. **Requirement Analysis**: In this we talked with the client and take a list of all the requirements like functionalities, design and security was discussed. Further in-house analysis of the requirements helped us to decide the costing and time needed for the project. This takes around 10 days and considered 10% of the total work.

ii. **Design Layout:** UI/UX design is done using adobe XD according to the sitemap and a mockup us produced to show the client to portray how the site will look like. This takes around 10 days and considered 10% of the total work.

iii. **Development:** The most important part of the project where the whole project gets life. The frontend and backend coding are done in this phase. This is the largest phase of the project and takes around 25 days and considered 47% of the total work.

iv. **User Acceptance Testing**: After the above 3 phases the project is shown to the client by arranging a meeting. All the functionalities and options are explained from our team. Then a detailed feedback is asked from the clients and revisions are done to the project as per the feedback. Quality assurance is also taken care in this phase. This takes around 10 days and considered 18% of the total work.

v. **Deployment:** Finally, after the approval from the client, the project is hosted on the client's domain and hosting and the CMS is handed over to the clients and necessary training is provided to the client. This takes around 5 days and considered 5% of the total work.

Task	Days	Work Percentage
Requirement Analysis	10	10%
Design Layout	10	20%
Development	25	47%
User Acceptance Testing (UAT)	10	18%
Deployment	5	5%
Total	60	100%

Table 1: Activity wise resource & time allocation

3.3 Gantt Chart

A Gantt chart is a project management tool assisting in the planning and scheduling of 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. [2]

We made a Gantt Chart which helped us to plan and schedule all the activities of the project in details.
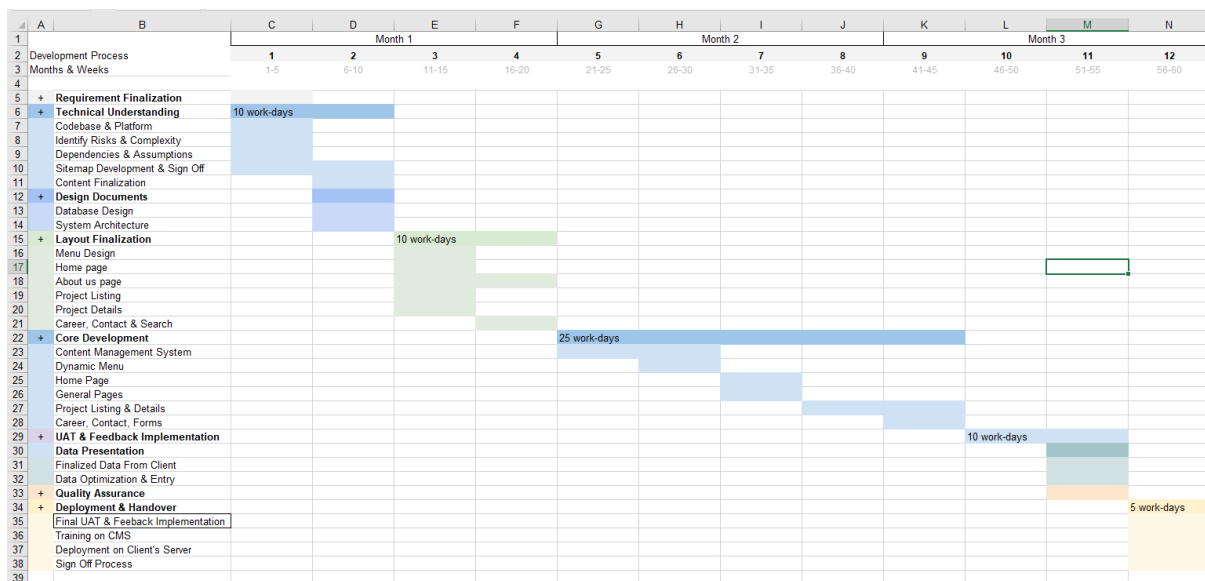

Figure 2: Gantt Chart

3.4 Estimated Costing

The costing of a web app project depends on several factors like size of the project, functionalities, design of the website and any additional feature demands by the client. Below is the estimated costing table we have where we have considered all the cost which includes design service like, theme, logo, icons, the cost for custom home page slider, live chat option, social media connection, SSL Certificate, SEO and other plugins and services provided. The cost of official resources used are also taken into consideration. The total costing was estimated at BDT 3,70,000 with domain and hosting and the possibility of additional charges if any additional service is required within 1 year of the deployment of the website.

Work Distribution	Costing in BDT
UX Development	70,000
Front End Development	1,20,000
Content Management System (CMS)	1,40,000
Domain and Hosting	40,000
Total	**3,70,000**

Table 2: Cost Estimation

Chapter – 4: Methodology

A system development life cycle (SDLC) is a commonly used method for project management to define the various stages of the project from start to finish. Through various phases of SDLC like planning, creating, developing, testing and deployment clear roles and responsibilities are defined and goals that is supposed to be achieved after each phase.

There are a number of methodologies and models available for SDLC, for example:

- Agile
- Lean
- Waterfall
- Iterative
- Spiral
- DevOps

Each of these models are different in some way, but all of them serves the same purpose of organizing a project and helping the team working on the project to work more effectively and efficiently.

4.1 Our Approach

For our project of Edison Real Estate website, we decide to use te Agile Model.

Agile model allows every project to be handled differently and modify old methods according to the requirement of the project. The tasks in agile are divided in small phases to deliver different features.

Iterative approach is taken and working software build is delivered after each iteration. Each build is incremental in terms of features; the final build holds all the features required by the customer. [3]

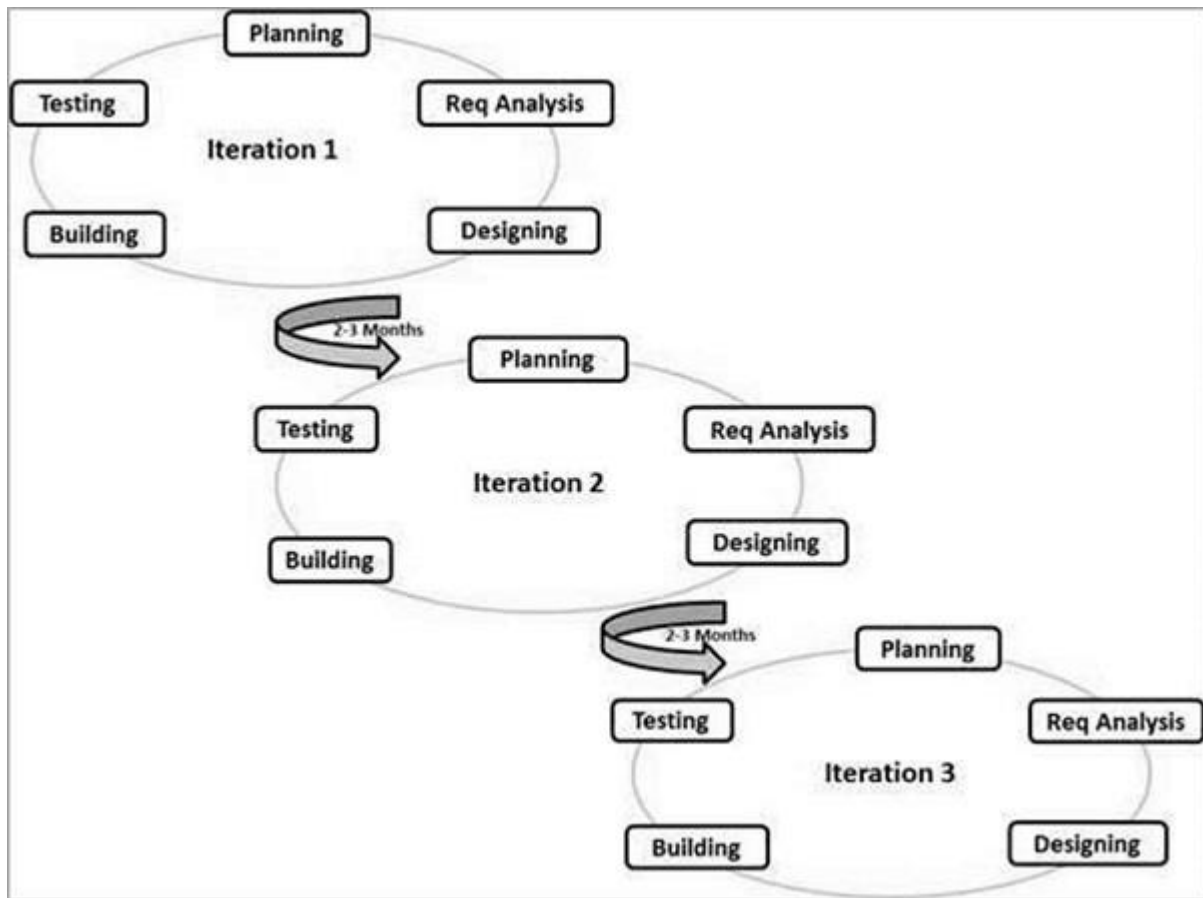Here is a graphical illustration of the Agile Model: [3]

Figure 3: Agile Model

The principles of Agile model are:

- **Individuals and Interactions:** Self-development by organizing and self-learning is an important part of Agile model and also at the same working and learning from the team and co-workers.
- **Working Software:** For clear communication and understanding the customers need a working software model is important besides planning documents.
- **Customer Collaboration:** Interaction with customers, taking their feedback after every phase is a vital part to gathering every tiny bits of customer requirements which is a little difficult to gather at the beginning of the project.
- **Responding to Changes:** Changes are made as soon as feedbacks are received in agile development.

We used agile development model to improve our productivity by organizing and planning the project properly. This also increased our efficiency and better communication between the team. It also ensures a better relation with customer since we are always on contact with the customer showing them demo and getting their feedback. This also helps to build confidence in customer and we also get all the necessary requirements done, reducing the risks. This model saves time and gives the best possible outcome of any project.

Chapter – 5: Body of the Project

5.1 Work Description

Edison Real Estate is a concern of Edison Group found in 2015. Edison Real Estate is focused on expanding their business of land and properties. Their sole goal is to reach their clients easily in order to sell their properties like flat and apartments through their website. The clients will be able to choose from the array of properties as per their liking. This website will aso help investors, who wants a joint venture with Edison Real Estate as a bridge of communication. Overall, the main aim of the website is to grow business in terms of sale and marketing and make a platform that will be an easy way of communication for clients and investors.

My job here was to build the website focusing mainly on the frontend and providing support in the backend.

The languages used for the frontend are:

- **HTML/CSS**
- **Bootstrap**
- **JavaScript**
- **jQuery**
- **Ajax**

Languages and frameworks use in backend are:

- **PHP**
- **YII2 (framework)**
- **MySQL (Database)**

5.2 System Analysis

A system analysis is carried out in order to help us to identify the goals of the system. System analysis is defined as a problem-solving technique which helps to identify goals and purposes to create a system to achieve these efficiently.

5.2.1 Six Element Analysis

	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Communication
Create Projects	Admin	Pen, Paper	Computer	Web Browser	RDMS	WAN/LAN
View Projects	User	Paper	Computer	Web Browser	RDMS	WAN/LAN
Update Projects	Admin	Pen, Paper	Computer	Web Browser	RDMS	WAN/LAN
Delete Projects	Admin	Pen	Computer	Web Browser	RDMS	WAN/LAN
Submit Form	User	N/A	Computer	Any related software	RDMS	Internet
Manage Forms	Admin	Record books	computer	Web Browser	RDMS	WAN/LAN

Table 3: Six Element Analysis

5.2.2 Feasibility Analysis

A feasibility study evaluates the project's potential for success; therefore, perceived objectivity is an important factor in the credibility of the study for potential investors and lending institutions. Generally, feasibility studies precede technical development and project implementation. In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained. [4]

Five feasibility studies are conducted for the project, which are discussed below:

    i.   **Technical Feasibility**: Technical feasibility is the assessment of whether the existing resources and technologies owned are sufficient for the development of the project. This assessment helps to identify if the requirement in terms of the technical skill of the team, technology used, hardware and software used are good enough to complete the project and also provide support in the future. Dcastalia being an established company

with vast experience on similar kind of projects ensures that they are fully capable of successfully completing the project.

ii.   **Economic Feasibility:** This analysis is conducted to find the cost and the benefit of the project. A detailed cost for the website development is estimated, which includes all the cost breakdowns. This cost is then generally compared to whether the company will be economically beneficial from the website. Since there is no charge for the visitors of the website, Edison Real Estate only aims to benefit from their website visitors and turn them into potential customer. The goal is to generate profit from selling their properties to these potential customers.

iii. **Operational Feasibility**: People are now more used to online shopping and services and the ongoing pandemic situation has also increased people's dependencies on online market and services. People don't want to take the risk of going out because of the pandemic and aso the bad traffic in Dhaka City. This website will help solve this problem for prospective buyers, they can get all the details of their desired property to help them make a decision, without visiting several locations physically.

iv.   **Scheduling Feasibility:** The project was planned very well before starting which helped to complete the project in due time. Dcastalia is very strict on deadlines so the working process is designed accordingly so the deadline could be met without any obstructions. All the tasks of the project were completed within the deadline and the website was handed over to the clients successfully.

5.2.3 Problem Solution Analysis

Since this was my first attempt to a big real time project, I did face a number of problems and issues. Most of them were small issues where I ad lacking of understanding for example, customizing the jQuery plugins for animation, maintaining the grid and responsiveness, writing SQL queries for the form. These small problems were solved instantly by the help of my team. They guided and explained where the problem was and how to solve the problem with examples from previous projects.

But there were some major issues we faced while doing these projects which are described below:

i. **Design issue on the map:** The side bar that we can see there would go under the navigation menu on top which made it impossible to close the sidebar.
We had to do some RD regarding this issue and we solved it by customizing the HTML and CSS code. We had to customize the 'div' and the CSS 'class' and had to use a few CSS functions to solve this.
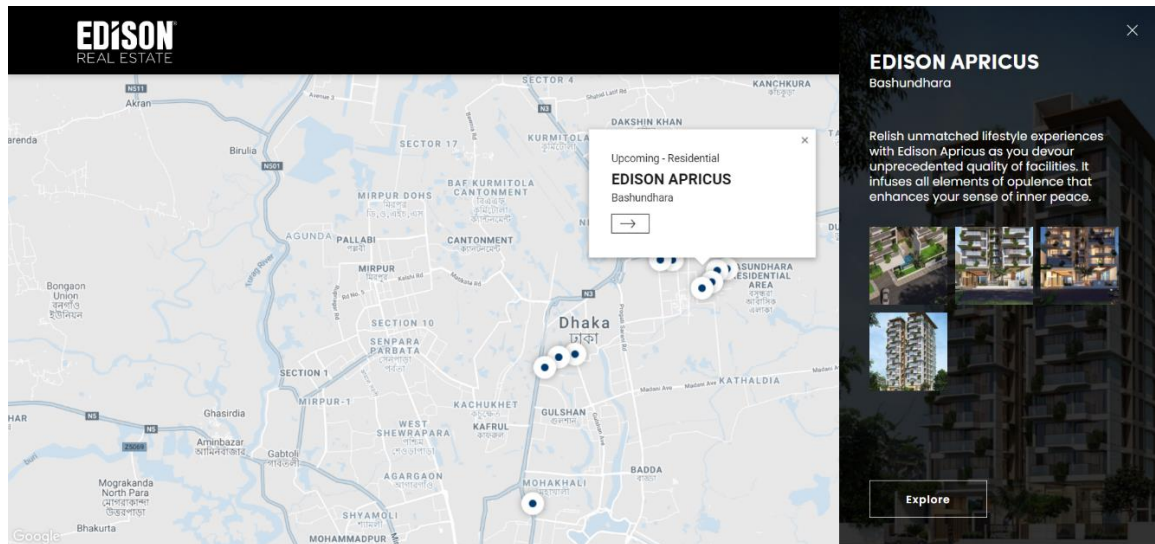

Figure 4: Map section after the solution

ii. **Design issue on the menu:** We planned for a static background for the menu but the customer wanted changeable images in the background for each option in the menu. This was challenging since the images caused problem with the visibility of the menu contents.
We then had to settle this problem by customizing the CSS code here and applying a new CSS property 'background-blend mode' for tinting the image. This was not a conventional CSS property that is used so we had to do some RD in this issue before we arrived to the solution.
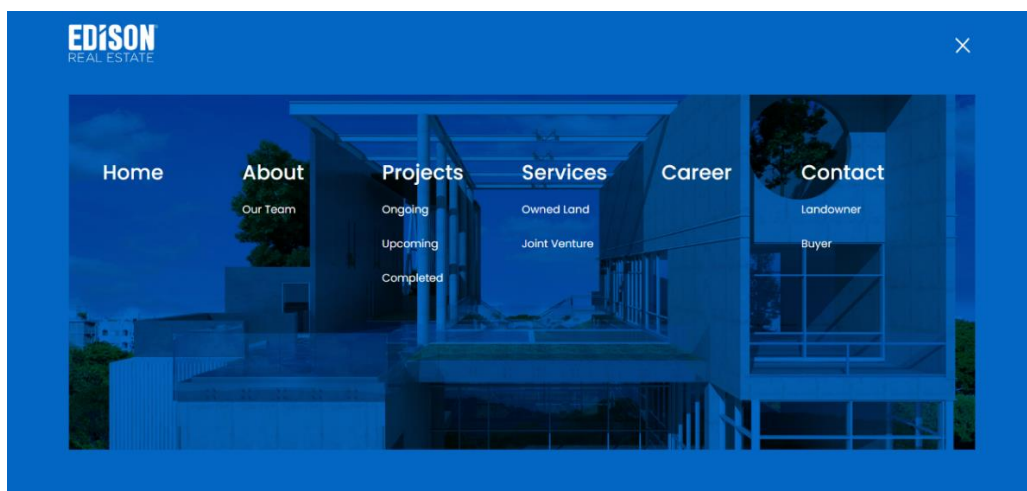

Figure 5: Navigation menu after solution

iii. **Project Filtering System**: We used a jQuery plugin 'Nice Select' in the drop-down option of the filters. This plugin allows a smooth and nice animation and visual look of the drop-down menu. But as the filtering was done through Ajax call, once we selected an option it was supposed to submit a request by firing an invisible 'submit' function and relevant data was supposed to be returned to the function. But due to using the plugin the request was not able to complete and no data was returned, which was supposed to happen.

We solved this through thorough RD and had to configure jQuery plugin and customized it.
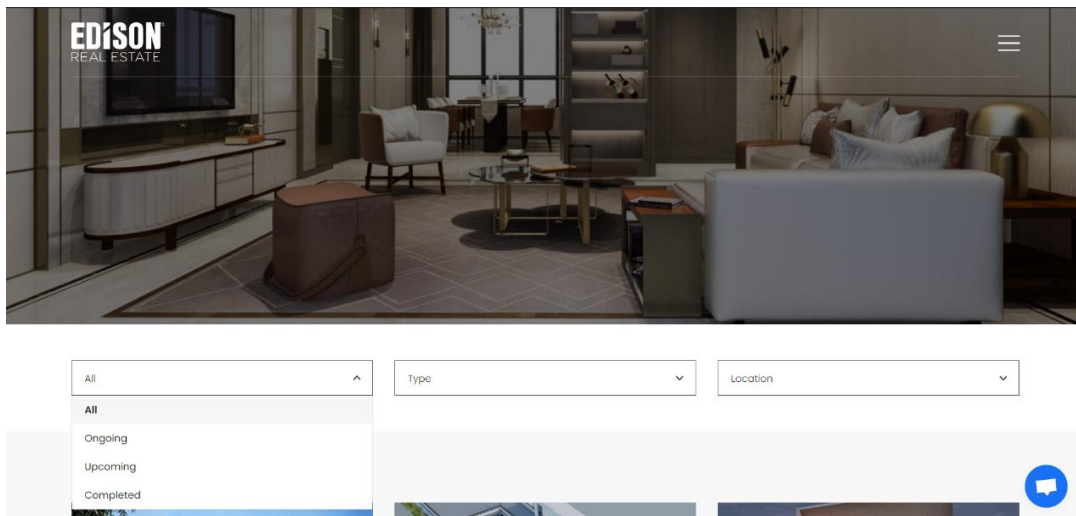
Figure 6: Project filtering after solution

iv. **SMTP mailer issue:** We faced issues configuring the SMTP mal server which resulted in failure of sending email.

We configured the SMTP mail server again and did some RD prior to configuring and the new configuration seemed to work.

5.2.4 Effect and Constraints Analysis

The website is built with the aim to provided its visitor with the option to view projects and easily decide on which property they want to buy. The goal is to make peoples life easier for property shopping. The website also provides easy contact solution with the company for the visitors, interested buyers or investors. The website also has the option for prospective employees to view job openings and apply directly.

Even among all these great features and the premium looking websites, we are aware that there are certain limitations. Considering that buying properties online is not the traditional way for people but we are hopeful that in near future more technological features like, 360° walkthrough options inside the apartments could be added and people would practically be able

to check and buy their desired properties online. This will make people's life easier and also help this real estate industry and the companies to grow and add a new milestone for this industry.

5.3 System Design

5.3.1 Rich Picture

A Rich Picture is a way to explore, acknowledge and define a situation and express it through diagrams to create a preliminary mental model. [5] We created a rich picture to create a model to map the significant journey of different kind of users.

The following Rich Picture illustrates how different user will interact with the website in order to view projects and end up buying a property, how a prospective employee will view job offerings and by filling up a form and submitting the cv will be able to apply it and also how the admin will handle his task of CRUD for projects and job postings.
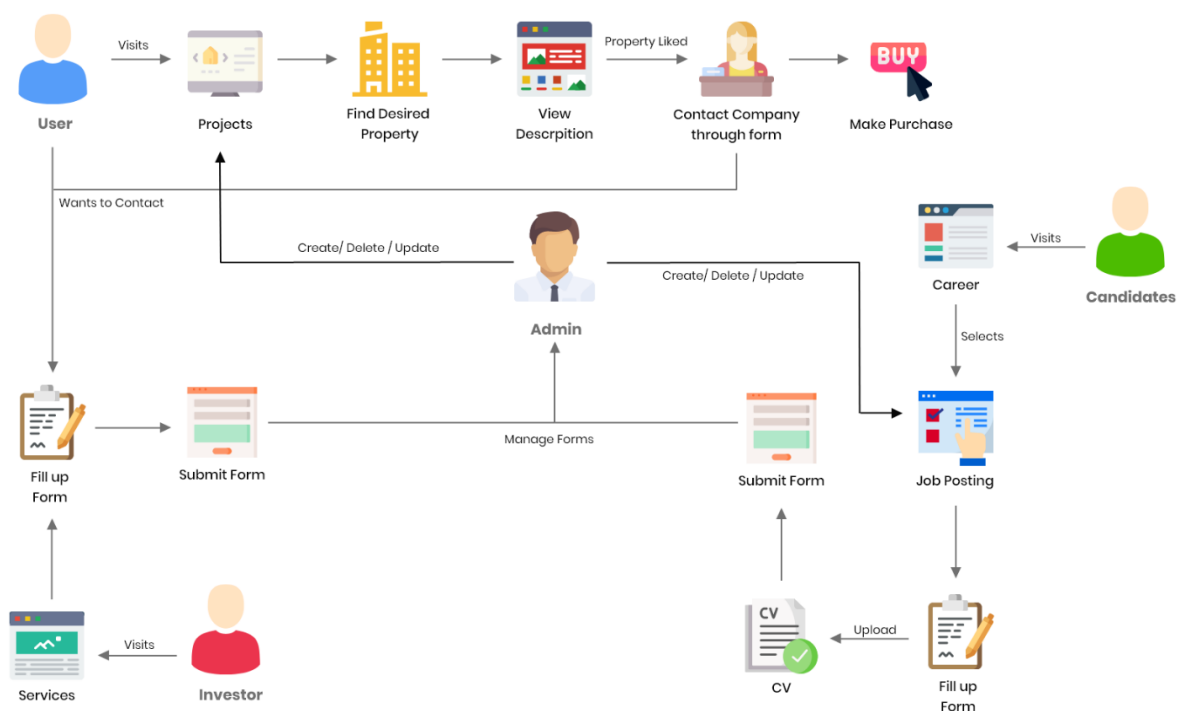
Figure 7: Rich Picture

UML, or Unified Modeling Language, is a specification language that is used in the software engineering field. It can be defined as a general-purpose language that uses a graphical designation which can create an abstract model. This abstract model can then be used in a system. This system is called the UML model. [6] There are different types of UML Diagram that can be produced for a project. We did **Activity Diagram** and the most important of all UML Diagram **Use Case Diagram.**

Activity Diagram: The workflow of a system can be illustrated by an activity diagram. The activity diagram for the user is drawn for 2 kinds of user:

- Prospective Buyer

- Prospective Employee

This diagram illustrates the journey of the users. We have designed the follow activity diagrams:
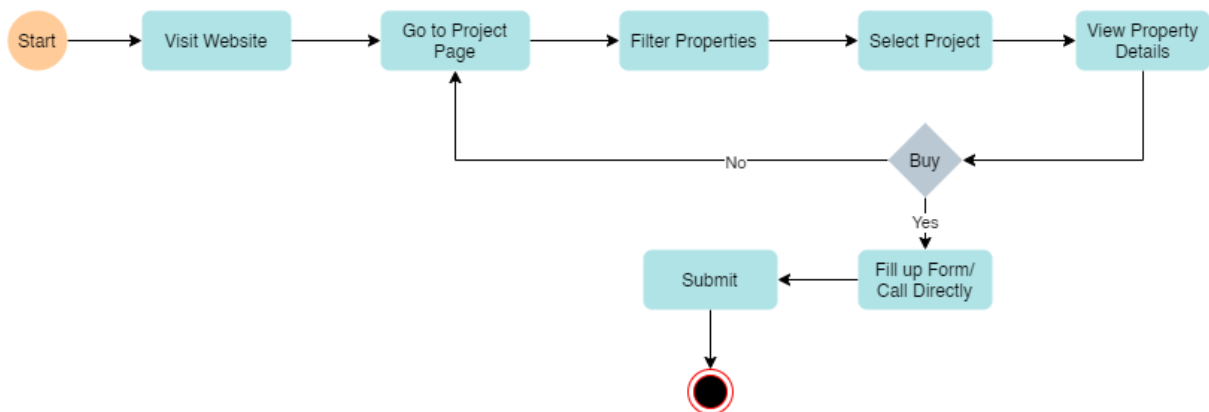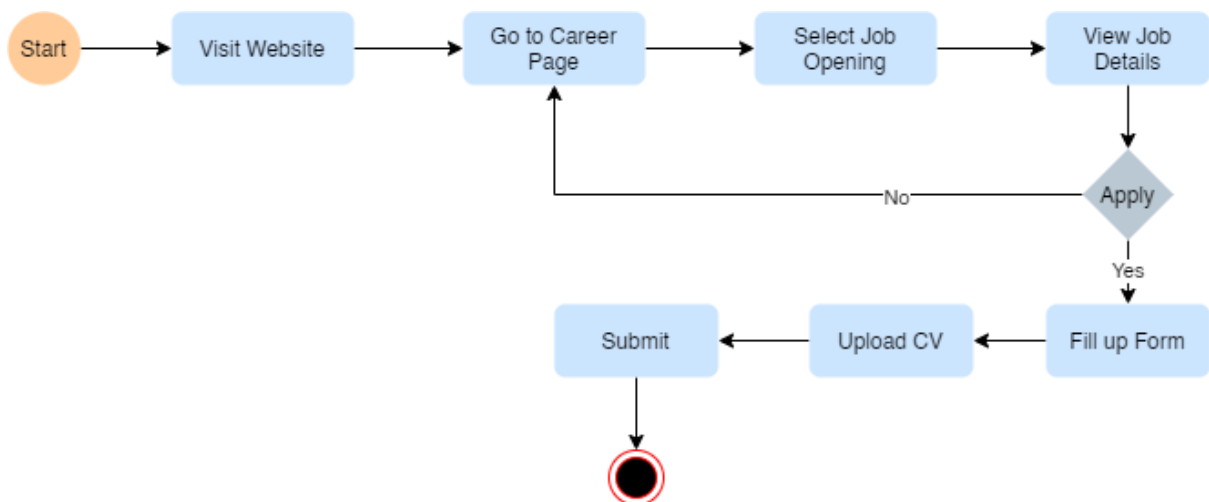

Figure 8: Activity diagram for buyers

Figure 9: Activity diagram for Employee

Activity Diagram for Admin: The activity diagram for the admin. This diagram illustrates the journey of the admin where he is in control of the admin panel (CMS).
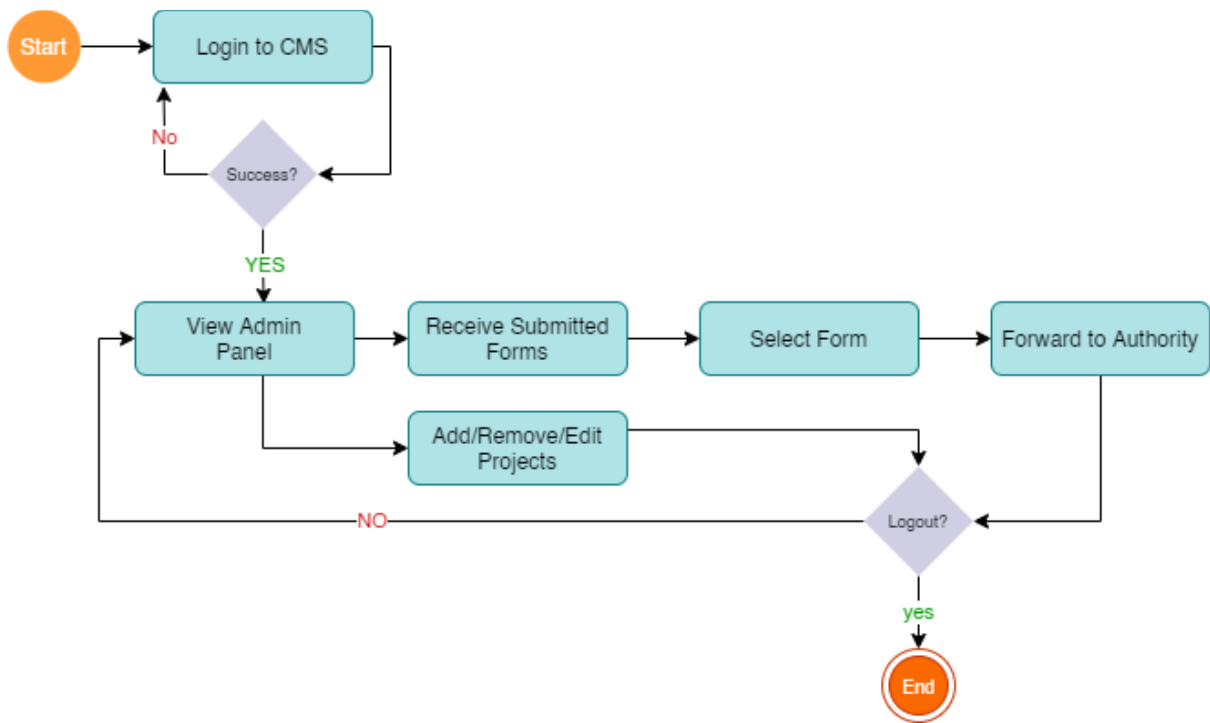

Figure 10: Activity diagram for Admin

Use-Case Diagram: As the most known diagram type of the behavioral UML types, use-case diagrams give a graphic overview of the actors involved in a system, different functions needed by those actors and how these different functions interact. [7]
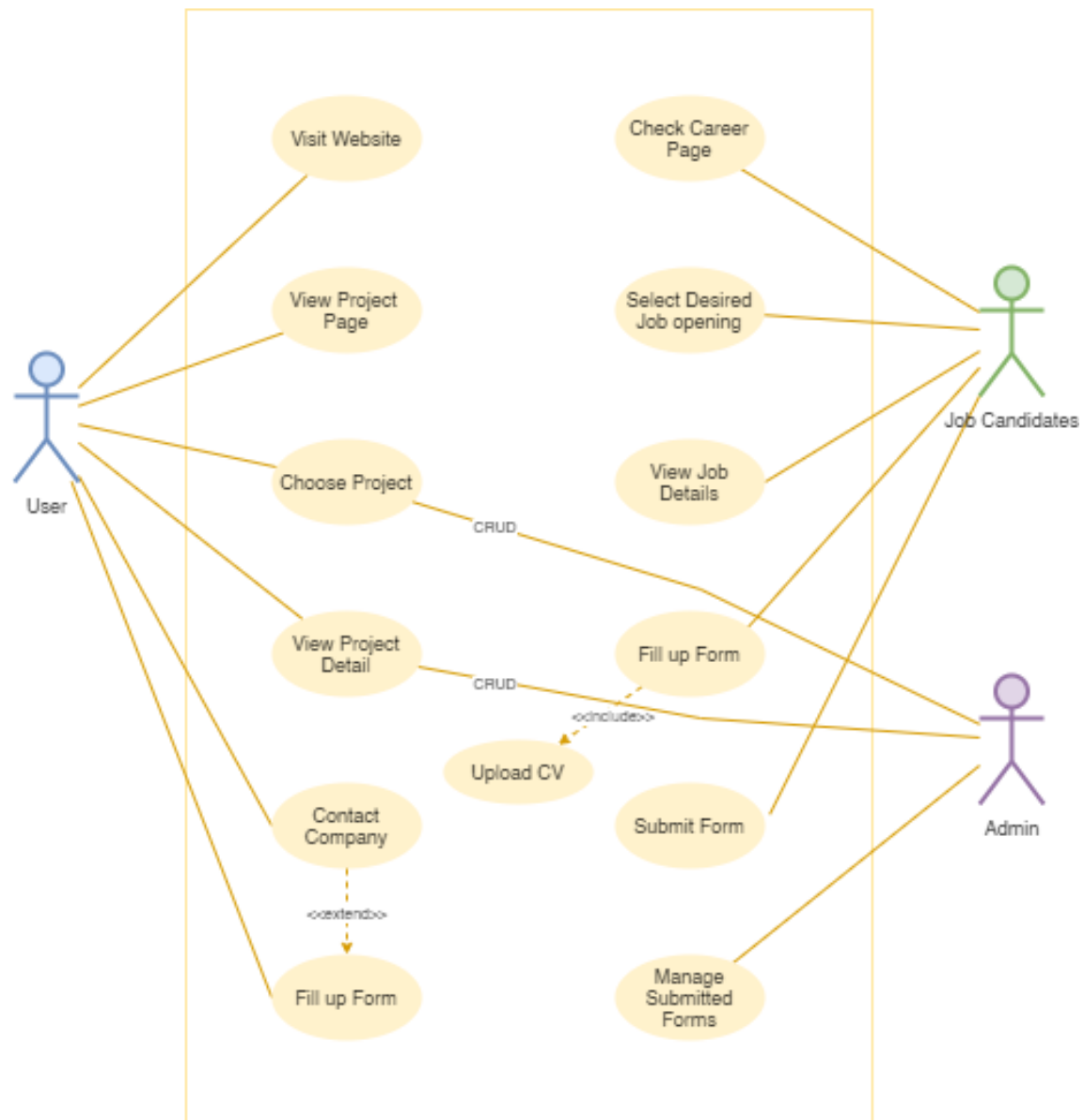

Figure 11: Use Case Diagram

ERD Diagram: An Entity Relationship Diagram is drawn to illustrate the structure and connection of the system with the database. It shows the entities which will be the tables in the database and the attributes of the entities. It also demonstrates the relationships of the entities with each other.
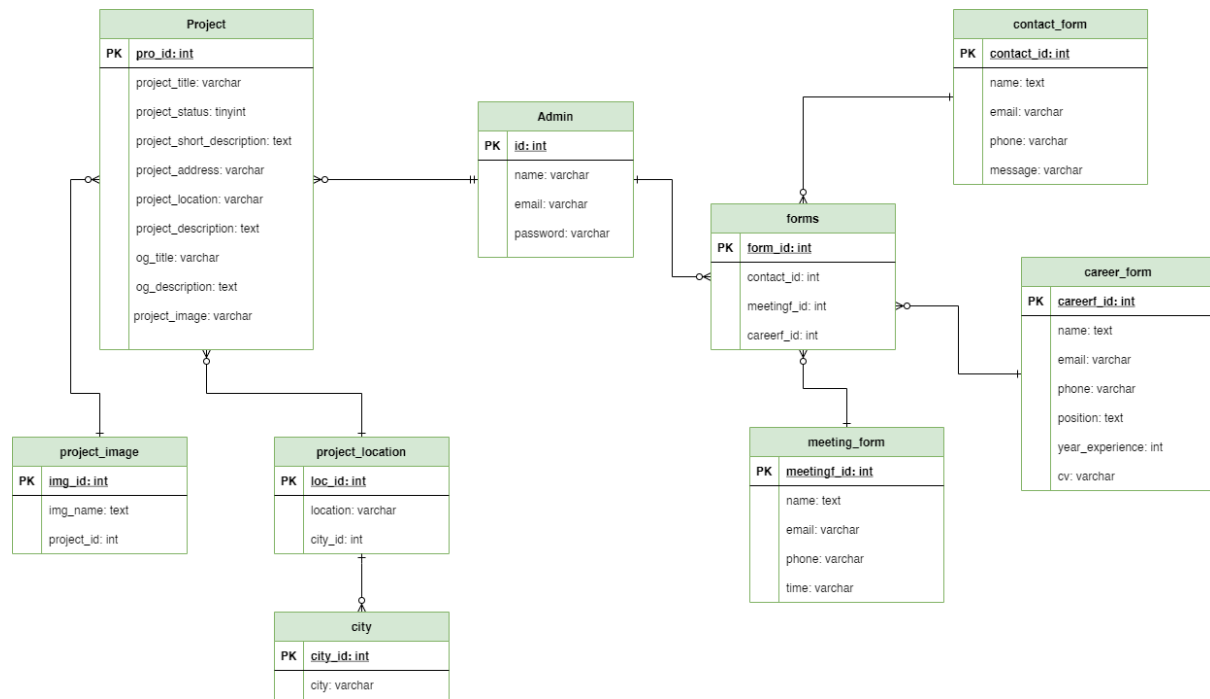

Figure 12: ER Diagram

5.3.3 Functional and Non-Functional Requirements

Functional Requirements:

Function:	Finding Desired Property	
Input:	**Process:**	**Output**
Select Category, Type & Location	Visits the website	Can view all project details
Pre-conditions:	User must have a device with internet connection	
Post-conditions:	User views the desired projects as per choice	

Table 4: Functional Requirement to find Property

Function:	Applying for a job post	
Input:	**Process:**	**Output**
Name, number, email, designation, experience & CV	Visits Career Page	Form is submitted
Pre-conditions:	User must have a valid email id & the CV must be submitted in PDF format	
Post-conditions:	Successfully submitted the form for the job post	

Table 5: Functional Requirement to Apply for Job

Function:	Contact with the company	
Input:	**Process:**	**Output**
Name, number, email, message	Visits Contact Page / From Home Page	Form is submitted
Pre-conditions:	User must have a valid email id & phone number	
Post-conditions:	Admin collects the form and forwards to authority	

Table 6: Functional Requirement to Contact

Non-Functional Requirements:

The non-functional requirements of the project are discussed below in brief:

- **Performance:** Performance defines how fast or slow the system will respond. So, in our project it defines on the loading time and also handling the traffic of the website. Through good code and content optimization and also configuring the server we tried to ensure a smooth experience for the visitors ensuring good loading time and traffic handling of the system.

- **Portability and Compatibility:** We made a user-friendly design for the system and also made it mobile responsive ensuring that the website will be responsive in most of the common resolutions. We also ensured cross-platform compatibility to make sure that the website runs on commonly used browsers without any issues.

- **Security:** The system is secured at both client end and server end. SSL certification, form validation through CORS – cross origin resource sharing is ensured to protect from unauthorized access and malware attacks.

- **Availability Requirements:** It's important for an online based system to be available at all times for the visitors, so we will try to ensure that the website is running at most times without any issues.

- **Maintainability Requirements:** The maintenance of the website should be very straightforward and any changes can be easily done through the admin panel. In case of any issues in the system it can also be fixed easily without making any major changes in the existing system.

- **Usability:** The system is designed in such a way that any users with basic computing knowledge can easily access this website and browse through it and find necessary information. UI/UX design has been done carefully to ensure a user-friendly design. The admin panel is also designed so the admin can easily maintain the website.

5.4 Product Features

Product features defines the functionality of the product and how that will benefit the users of the product. I have discussed the features of our website below:

5.4.1 Input

The input for a product is whatever resource is needed for system. This includes resources used in the production stage like money, time, people, skills and efforts, documents and plans, machines and hardware used. In our scenario the computer we have used and also the computer used by the visitors, the processor, ram, hard drive space, internet, devices like phone and laptops are all included in the input. Also, software that might be used are also included like PDF reader to read the CV of the applicants.

5.4.2 Output

In context to our project all the features, products and services of the company, anything that is gained from the website is considered an output. Some of the outputs are:

Online Consultation: The live chatbot can be used to consult with the company online and also the form can be used to reach them. The consultation enquiries can be done online instantly.

Job: Prospective candidates can apply for job from the website which can potentially ensures a job form them in the company.

5.4.3 Architecture

An architecture defines the backbone of any structure. It is mapped to show how a structure will stand. For a website a website architecture defines the structure of the website, that is how the website will work, how the data will be transferred and where they will be stored.

To discuss more in details, we can refer to the architecture we designed for our project. Here the diagram clearly illustrates that user can only see and interact with the front end of the website, the frontend receives the request or commands from the users and transfer it to the webserver, which then retrieves and stores data from the file system and database accordingly and sends it back to the frontend for the users as a response.
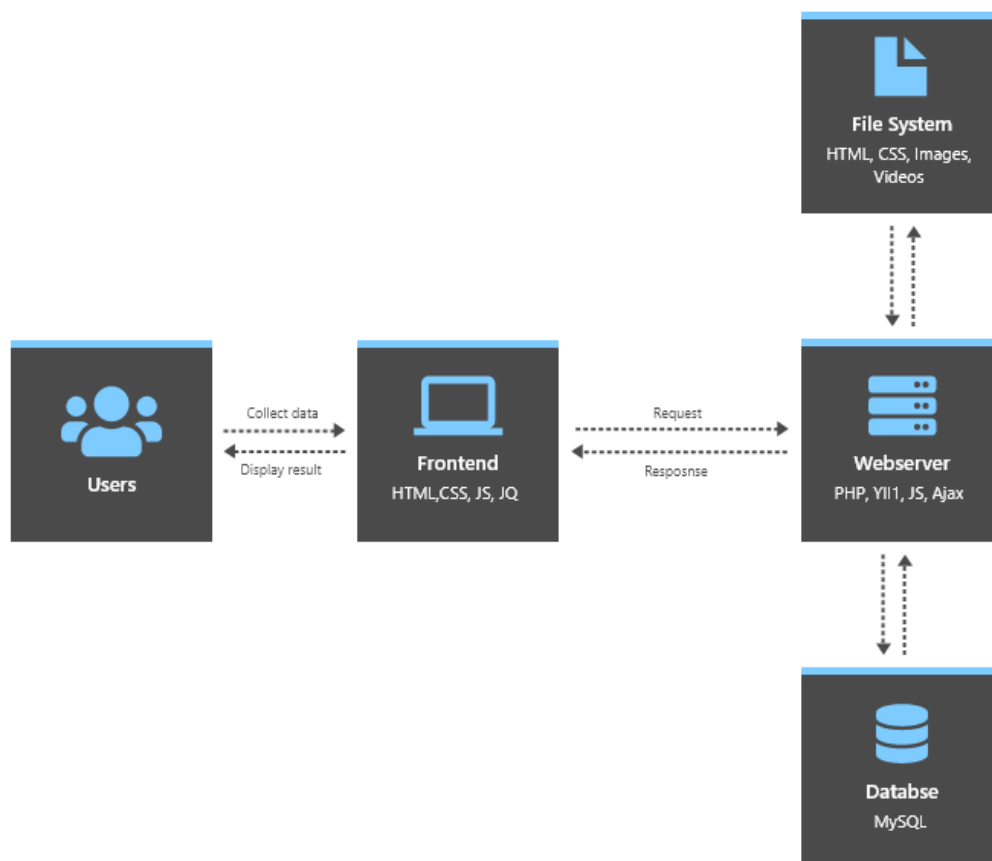
Figure 13: Website Architecture

5.5 Implementation

For our project to build a website for Edison Real Estate, we used a number of web languages, frame works and scripts.

- **HTML/CSS:** HTML is a hypertext markup language that is specifically used to design front end of the website, with the help CSS properties and integrating with our HTML codes, we ensure a modern, user friendly User Interface of the website.

- **Bootstrap:** Bootstrap is a CSS framework used to develop responsive websites. We used Bootstrap to make the website responsive and mobile friendly, also used Media Query for custom screen sizes.

- **JavaScript:** JavaScript programming interpreter. We used JavaScript in our front end along with HTML/CSS for the animations and effects.

- **YII2:** YII2 is a component-based PHP framework, known for its high performance. PHP is an open-source scripting language. We used YII2 framework for our backend code.

- **MySQL:** MySQL is a relational database management system. We managed our database our database and backend through SQL queries

Chapter – 6: Results & Analysis

6.1 Results

The project of Edison Real Estate was done to with aim to create a modern website and to promote the marketing and selling of property online. Edison Real estate wanted to increase the exposure on their company and attract more clients and grow their business. They believed a strong online presence will help them in their cause, as people will be easily able to find their desired property from their website. We catered to their need and built a website for them meeting most of the requirements given by the client.

Below is an overview of what we have achieved in the project and how that will help the visitors of the website:

Menu: A global menu is used in the Navigation Bar. The menu is accessible through the hamburger icon, which gives a Fullscreen menu to access different pages of the website. The background of the menu changes with hove on each options of the menu. The menu can be access from all the pages at any time since the navigation bar is made sticky.

Footer: A global footer is there, accessible from all pages with contact details and social media links

Landing Page: The landing page or the index page is first page that a visitor is able to see in the website. This page is designed to give an overview of the whole website.

A slider is used with project filters to improve user interaction with the website. Visitors can select prom the type of projects here and view specific projects.

A short description of the company and a video about the company is show in the About us section with the option to view details about the company, its goal and beliefs.

A featured project section is shown by using a slider. Slick slide plugin is used here to. All the projects are accessible and further details can be seen by clicking on them.

A section for investors is there so the investors can see the details on how to collaborate with Edison Real Estate. There is also a testimonial section which is also a slider, showing the reviews by their customers.

In the next section there is an interactive map showing the location of the projects. The location markers are clickable which shows the available projects on the location and can be seen the details eventually. This section is then followed by a counter which shows the number of currently available projects and another section with a contact form to easily contact with the company for any queries.

About Us Page: The about us page is designed in such a way that it gives a detailed overview on the company. Starting from a summary on the mother company Edison Group and our client Edison Real Estate with the option read in details. There is also a video section with it to show

the visitors a video introduction of Edison Real Estate. The video section is developed with the help of plugin – Light Gallery.

There are sections for the companies Purpose, Vision and Values followed by a message from their Chairman and his details.

A visual of the company's board member are provided with the help of Slick Slider plugin and an option to get the visitors introduced to the whole team.

There is not much interaction for the visitors on this is an informative page focusing on introducing the visitor with the company.

Project Page: The project page is designed and developed to showcase all the project of the company and help the visitors and prospective buyers to search for their desired property.

Visitors of the site can easily view all the projects and can see the details of the project by clicking on each of the pictures. The user will be redirected to the *property details page*. The UI is made user friendly so visitors can easily access the projects.

A filtering option is integrated here with 3 criteria to filter with. The visitors can filter with status of the property, type of the property and location of the property all show with drop down menu. Once selection is done filtered properties will be show to the visitors.

Property Details Page: These pages show the details of a specific property. Staring from the address, overview, specification like apartment size, land size, handover Date, number of apartments etc. It also shows the picture of the projects with a gallery to display multiple images. There is also a progress bar to show the progress of the project and current status

Then there is a detailed section to show the features and amenities that will be available on the specific property and also a story on the interior and exterior of the project.

All these details allow users to visualize the property with the help of the images as well and helps them to take a decision on whether to go forward with buying a property from this project.

Career Page: This page is developed for the prospective employees of the company.

Visitors will get to know why they should join the company given as information.

They will be able to see all the recent job posting of the company and will be able to so all the details of the job. The visitors will also be able to apply through the form given on the page by filling it up with necessary informations and uploading CV in pdf format.

Contact Page: The purpose of the page is to allow visitors of the website to contact the company with ease.

Details on the companies contact information are given as well as a contact form is given to reach Edison Real Estate with any queries. Users will need to fill up the form with necessary information and their query as a message.

There is also Frequently Asked Question section developed as an Accordion to help visitors find the common questions asked.

Chat Bot: A chatbot plugin is integrated in the website accessible through the message icon from any page. The chat bot is integrated by the help of a JS plugin. The visitors of the site can easily chat with the representative of the company live using the chatbot.

6.2 Introduction to Test Case

A test case is a document, which has a set of test data, preconditions, expected results and postconditions, developed for a particular test scenario in order to verify compliance against a specific requirement.

Test Case acts as the starting point for the test execution, and after applying a set of input values, the application has a definitive outcome and leaves the system at some end point or also known as execution postcondition. [8]

We have conducted a test case for Edison Real Estate to assure quality and the functionalities of the website.

6.2.1 Issue Tracking and Reporting System

The project will be uploaded in Dcastalia's test server and the URL will be shared among the development team and a specialized QA tester. The testing phase by the QA tester will start in the midst of the development along with the development team members. All the modules and functionalities will be tested. Once a problem is found, the issue will be noted down in a share google sheet with detail comment on the issue. The developer will fix the issues once fixed will mark the issue as fixed in the sheet. After the initial development is done the system is rechecked again by the Dcastalia team and the QA tester for issues. Issues are reported and fixed once again before the test server url of the project is shared with the client for testing. Feedback is received from client and issues are fixed if needed after that before the final deployment of the project.

6.3 Test Case Analysis

The following functionalities has been tested for this particular website:

- Admin login to CMS
- Add project
- Delete project
- Update project
- Change password
- Logout
- Mobile Responsiveness
- Contact forms

6.3.1 Test Table

#	Case	Action	Precondition	Steps	Expected Result	Result obtained	Status	Remarks
1	**Login**	Admin login	i. Connected to the admin panel through internet. ii. Valid login credentials.	i. Add admin information to the users table in DB. ii. Fill up the fields and Press login button.	i. Logins in to the database and view the dashboard interface. ii. Wrong credentials give an error message: "Login failed".	Login successful.	Pass	N/A
2	**Add Project**	Admin can add new projects of the company	Must be logged in to the admin panel	i. put relevant project informations in the appropriate fields ii. Clicks on Save button to add new project	New project will be added	New project added successfully in the DB and visible in the website	Pass	N/A
3	**Delete Project**	Admin can delete a project from the DB	Must be logged in to the admin panel	i. Goes to the list of projects ii. Selects the project to be deleted iii. Press on the delete icon iv. Confirms to delete by pressing confirm button	Project deleted from the system and website	Project successfully deleted	Pass	N/A
4	**Update Project**	Admin can edit the project details	Must be logged in to the admin pane	i. Goes to the list of projects ii. Selects the project to be edited iii. Press on update icon	Existing project will show updated informations of the project	Data were updated successfully except the Project Description field	Fail	Check codebase

			iv. Edits required fields to update v. Saves the changes by pressing Save button				
5	**Change Password**	Admin can update password	i. Access to the admin panel ii. Logged in as admin	i. Login to the admin panel ii. Click on the user's icon and selects change password iii. Input old existing password iv. Input new password v. Confirms new password vi. Clicks Save to change password	i. A message to confirm that password has been changed successfully is shown ii. Changes not saved message is shown if passwords don't match	Password change is successful and new password can be used to login	Pass	N/A
6	**Logout**	Admin can successfully log out	i. Needs to be logged in to the admin pane	Click logout from user menu in profile icon	Logs out from the admin pane	Successful logged out	Pass	N/A
7	**Mobile Responsive**	The design and layout is responsive to the commonly used screen size	i. Any user with internet connection can view the responsiveness	Visit the website URL	Design is responsive without breaking the layout	The website isn't perfectly responsive to all common screen size.	Failed	Check Bootstrap implementation and Media query code.
8	**Forms**	Fill up the contact form and submit	Connected to internet	i. visits the website ii. Fill up the form and click submit button	A success message is show upon submission	Success message received and the message is received by admin	pass	N/A

Chapter – 7: Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

In this modern world full of competition, every system needs to give attention to sustainability. It is a challenging task but to survive in long run ensuring that the purpose of the system is served to the consumers, sustainability is essential and plays a vital role.

In software and web development cases the systems are made sustainable in order to ensure that it serves indefinitely without any problems both on the owners and the user side. To ensure sustainability in our project the website is designed in such a way that the website is accessible regardless of the environment of the user's machine.

The website we created is not dependent on the user's computer specification, operating system, resolution or internet speed. The website will run on all computers, smartphones using the commonly used browsers.

The sustainability of the website will also be maintained through regular maintenance of the website and its server. The HTML, CSS, JS and backend code for the website is well optimized. By reducing repetitive codes, minifying different scripts that are used, and maintaining proper coding standards it is made sure that the website performs well and easily accessible by users regardless of the device's specification.

Regarding the design and layout, the website is designed in a user-friendly manner, giving importance to the User Experience. The visitors with minimal computer knowledge will be able to easily access and navigate through the website. The media files like images, videos, icons and logos are all optimized to ensure good loading speed of the pages so people with low end devices and slow internet can also access the website.

7.2 Social and Environmental Effects and Analysis

The website of Edison Real Estate shows all its projects where users can easily access the website to gather information on a specific property. This helps people to save time by gather the information online rather than visiting various sites to make a decision. People can do this from the comfort of their homes rather than dwelling in the city traffic for hours which also saves fuel and a less car on the street means a little less pollution caused by vehicles.

People can also apply for job through the website and contact the company without visiting their office physically. There is option to live chat which saves people from making call which saves money.

Also given the recent pandemic situation it is encouraged to stay home and have less physical contact with people. The website also helps a great deal in this cause as buyers don't have to visit all the project locations physically, people interested in job don't have to physically go to the office to drop their CV.

The website is designed and developed to ensure high efficiency with less usage of resources. We tried to optimize our code, media contents as much as possible. The website is ad free, less redirections, and only basic plugins are used, all these helping in overall optimization, resulting in using less power and saving energy.

Our office environment is equipped with energy saving machines and equipment and operated fully digitally. We are always aware of not to waste electrical energy in our office environment. This allows us to be energy efficient and also helps us with less usage of paper contributing to a positive effect on the environment.

7.3 Addressing Ethics and Ethical Issues

The more technology driven our world is becoming now, the more it is important to address the ethical issues and follow the common practice of ethical rules and guidelines. Sensitive data are always exchanged on the internet through various system so it must be ensured that the data are not breached by any means.

We made sure our project data is secured enough from hacking or breaching. We made sure no extremely sensitive data is collected through the website, only data that are required like, name, phone number, email address, CV is stored. Proper security measures are taken to protect these data from any kind of leak. The data are safely stored in cloud and sensitive data like password is encrypted. These data are only accessible by the Lead Developer of our team through proper credentials and no one in our team has access ensuring safety of the data.

All the project related documents, deals and agreements, codebase are also kept confidential by Dcastalia to ensure the privacy of the company and our clients.

Chapter – 8: Future Work & Conclusion

8.1 Problems faced during this period

The internship experience in Dcastalia limited and working on a real-life project was very helpful in terms of learning and gaining knowledge. I got the to learn from the very skillful developers who have a vast amount of experience. Although the wonderful experience there were certain limitations in my period of internship.

The major limitation for me was the world-wide pandemic situation of COVID-19 going on. I had to take the risk of exposing myself by going out for office and working in a closed environment. It was also quite difficult maintaining all the safety measure for 8-10 hours works, like wearing the mask at all times. This was definitely uncomfortable and I believe also affected my efficiency as the thought of being exposed and being cautious at all times was also a source of huge mental stress.

Despite being cautious I still got affected which caused me to took some time off the project and continue the rest of the project from home. This hampered my proper learning of some vital part of the project.

It was also challenging to learn so many new technologies at such a short time. I didn't get to learn the technologies in depth as much as I would have liked given the fact that I was on a deadline. So, the learning had to be rushed. It was very stressful to learn and implement the knowledge at such a short time. It was difficult for me to cope up with the pace of the experienced developers in the team.

8.1 Solution of those problems

The whole world right now is affected with the covid and fighting the pandemic as much as we can, but still, everyone is at a loss due to this situation one way or another. We all are waiting to find a cure and the 100% working vaccine for this deadly virus. Until then we need to maintain the safety protocols and being cautious.

The solution to the next problem is to keep learning and practicing the technologies more in depth. Spending more time with these technologies will surely make me an expert like the other developers in the team in near future.

Chapter – 9: Future Work & Conclusion

9.1 Future Works

The idea of a proper real estate business website should not only be used for gathering information of the properties but also being able to buy properties through the system. Although this is a very ambitious idea and people are still not used to this and accept a new way of buying property rather than the traditional way but it is indeed a possibility. We do plan to make the website more informative by adding walk through the apartment option where users will be able to view the 360-degree view of the apartments. To summaries the scope of future work, we do plan to do the following in near futures:

- Add e-commerce functionalities i.e., to buy properties.

- Add "Walk Through the Apartment" option.

- Develop an android application

- Add multiple language option

- Update the project with React.Js for better performance.

9.2 Conclusion

The project of Edison Real Estate is successfully deployed. My company and our clients are happy with the outcome we achieved. We believe there are still scopes for improvement which we will work on gradually. Now Edison Real Estate has marked its presence in the internet and we hope the website helps them to grow in terms of a brand and a business. We wish them good luck.

My internship experience in Dcastalia was tremendously good. Working in a company with a professional team in the IT sector was a very fruitful experience for me. I learned and applied new skills and techniques, which did not only result in creating a professional website, but also helped me to increase my set of skills. My professional skills, communication skills and last but not least technical skills have gotten better, thanks to Dcastalia. They helped me in every step and guided me whenever I needed. I have also learnt how to work in strict deadline and work under pressure. But my team members played a vital role to make my job easy with their advices and suggestion and I never felt like a new comer in the company. This internship has also helped me to get introduced in the website development sector, and I am surely going to learn and pursue a career in this sector. The internship made me more confident in myself than before and I believe I am ready to step into my professional career.

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Appendix

UI Images (Screenshots)

Figure 14: Menu UI
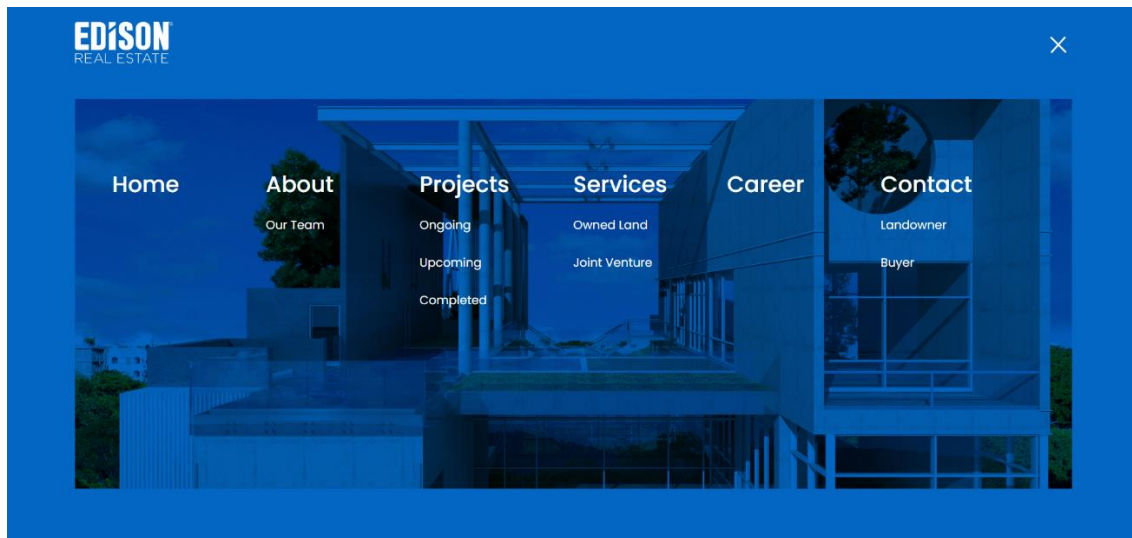
Figure 15: Footer UI
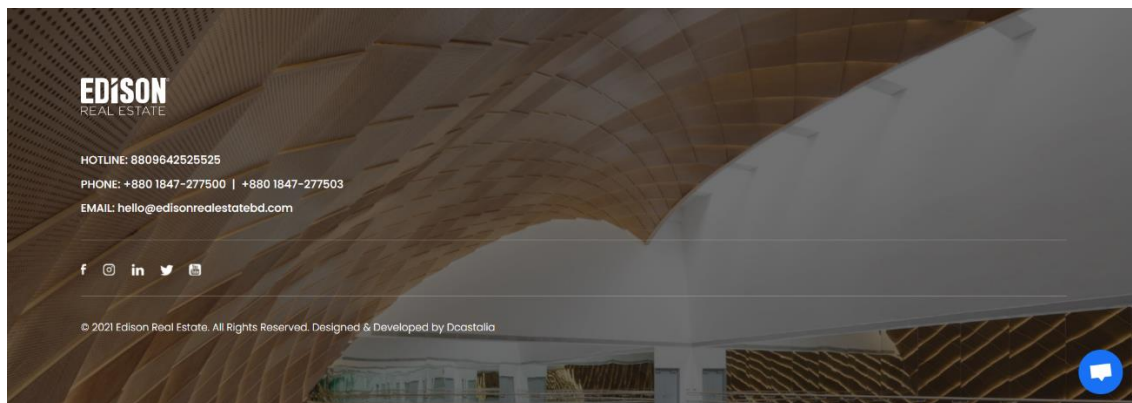
Figure 16: Landing page UI

Figure 17: About us UI

Figure 18: Project page UI
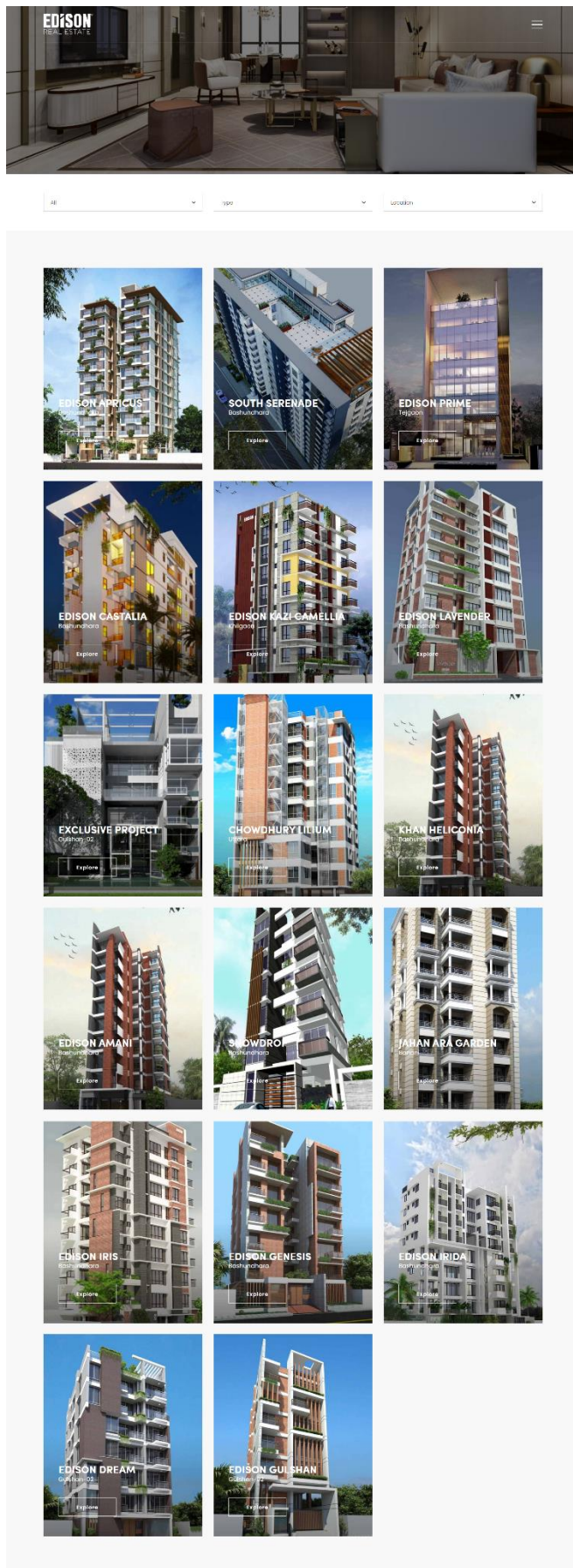
Figure 19: Project Detail UI
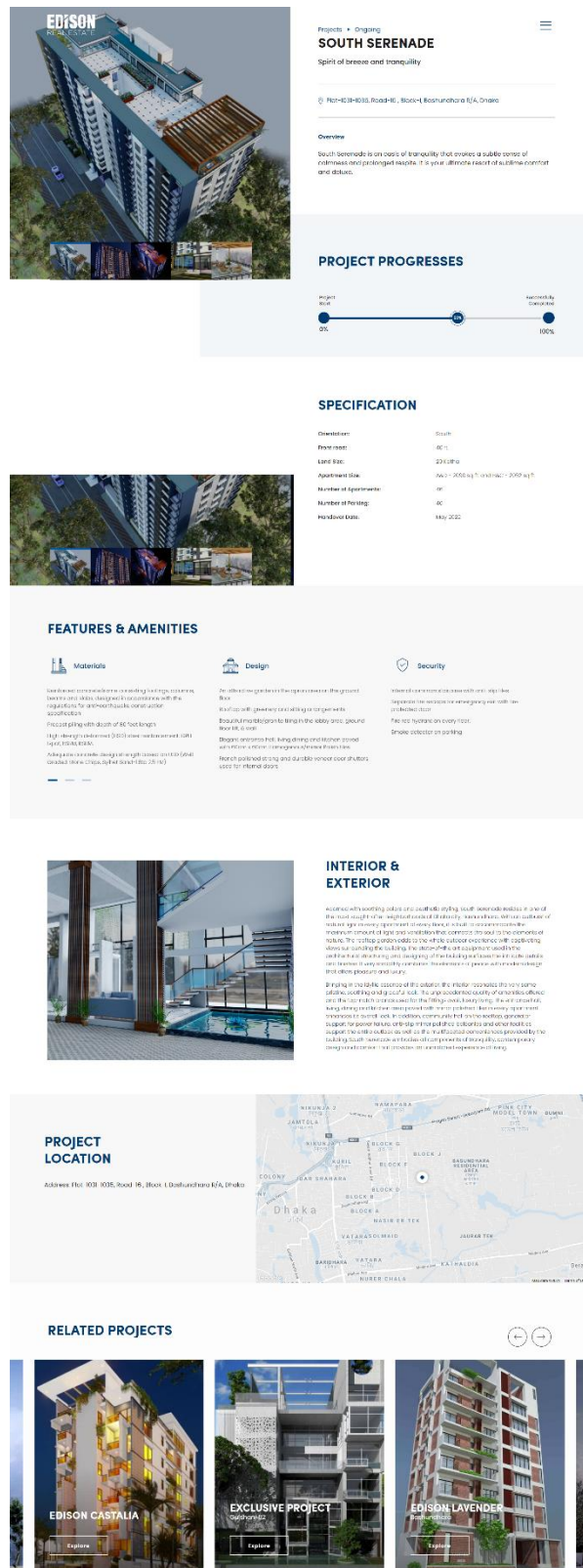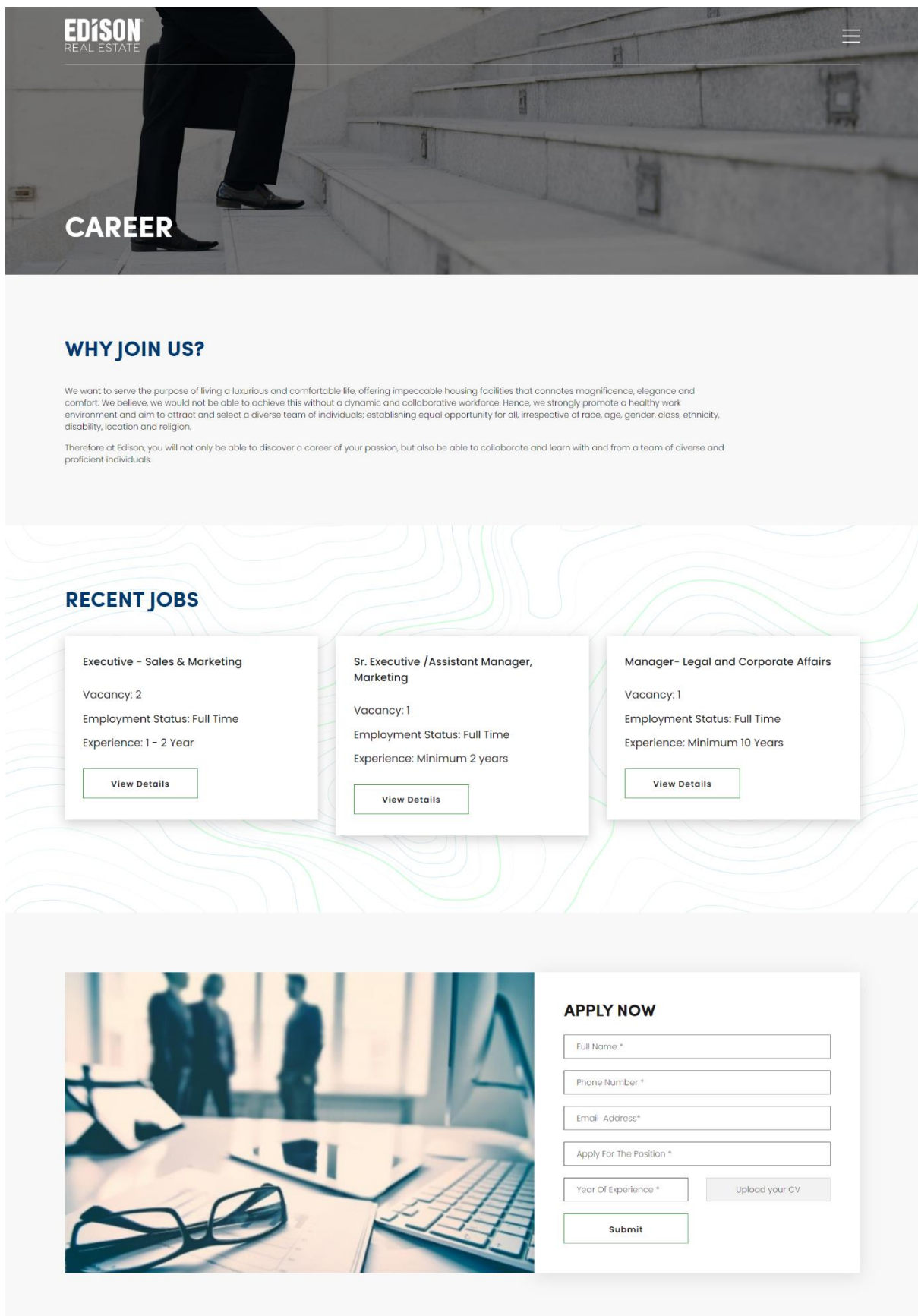
Figure 20: Career page UI

EDISON
REAL ESTATE

CAREER

WHY JOIN US?

We want to serve the purpose of living a luxurious and comfortable life, offering impeccable housing facilities that connotes magnificence, elegance and comfort. We believe, we would not be able to achieve this without a dynamic and collaborative workforce. Hence, we strongly promote a healthy work environment and aim to attract and select a diverse team of individuals; establishing equal opportunity for all, irrespective of race, age, gender, class, ethnicity, disability, location and religion.

Therefore at Edison, you will not only be able to discover a career of your passion, but also be able to collaborate and learn with and from a team of diverse and proficient individuals.

RECENT JOBS

Executive - Sales & Marketing

Vacancy: 2

Employment Status: Full Time

Experience: 1 - 2 Year

View Details

Sr. Executive /Assistant Manager, Marketing

Vacancy: 1

Employment Status: Full Time

Experience: Minimum 2 years

View Details
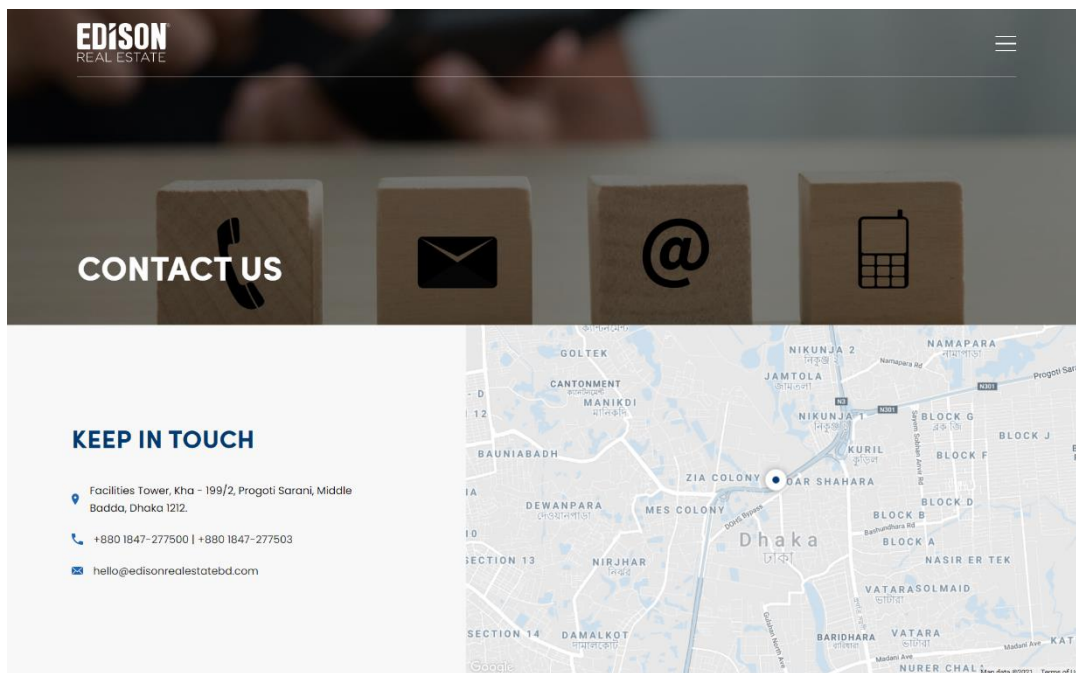
Manager- Legal and Corporate Affairs

Vacancy: 1

Employment Status: Full Time

Experience: Minimum 10 Years

View Details

APPLY NOW

Full Name *

Phone Number *

Email Address*

Apply For The Position *

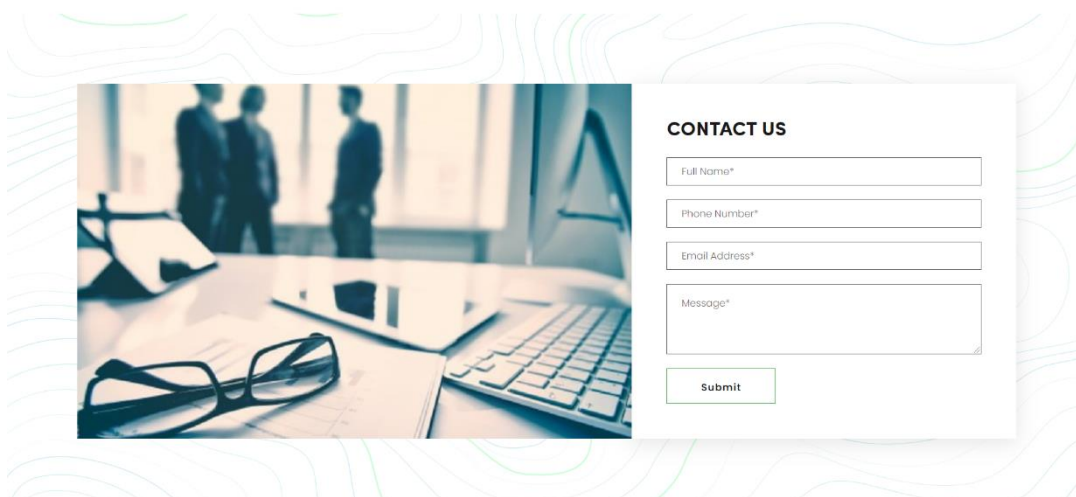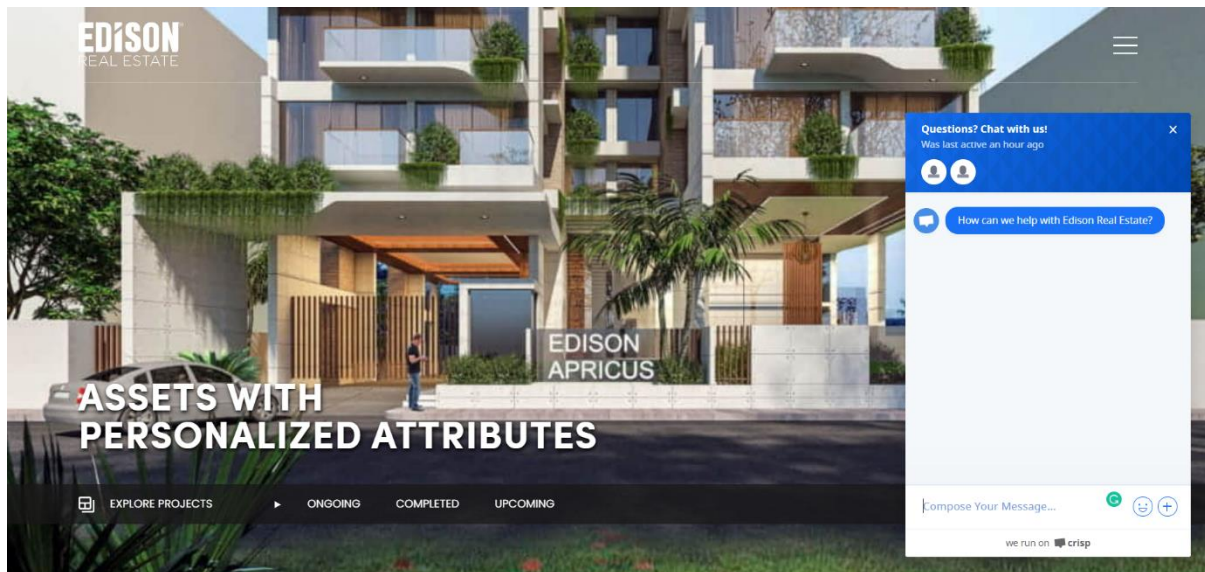Year Of Experience *   Upload your CV

Submit

Figure 21: Contact page UI

Figure 22: Chatbot UI

Figure 23: Admin panel (CMS)