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An Undergraduate Internship on Personal Portfolio

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An Undergraduate Internship on Personal Portfolio

By

Rubayat Islam Toma

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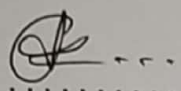
Autumn, 2022

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January 19, 2023

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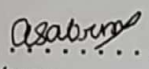


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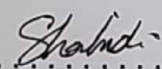


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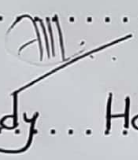


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An Undergraduate Internship/Project on yourTopic

By

Rubayat Islam Toma

Student ID: **1720579**

Autumn, 2022

Consent from Supervisor

The student modified the internship final report as per the recommendations made by his/her academic supervisor and/or panel members during and/or before final viva, and the department can use this version for archiving as well as the OBE course material for CSE499.

(Signature of the Supervisor)

Md. Sanzar Adnan Alam
Name of the Supervisor

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Attestation

I Rubayat Islam Toma bearing ID-1720579 state that this report is completely made by myself under the supervision of my respected faculty member Sanzar Adnan Alam. I have completed and submitted this document for the partial fulfillment of the requirement for the Degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). All the works here are the result of my work experience in Techno Drugs Ltd. and study from different blogs, research papers etc that are referenced in the report.

Rubayat

Signature

10-01-2023

Date

Rubayat Islam Toma

Name

Acknowledgement

First and foremost, I am grateful to Almighty Allah as I am able to complete the report within due time.

I am extremely grateful to the CEO Sohab Ahmed, Techno Drugs Ltd. as I was given an opportunity to work with their excellent development team as an intern. They have helped me to carry on with my work in a professional environment.

This report on my work could not have been possible without the help and guidance of my respected supervisor Sanzar Adnan Alam. He arranged several progress meetings during the full completion of the report from the very beginning. He helped me understand why this report is so crucial and how I can make sure to express my work through this report in the best possible way. He also gave feedback on different parts of the reports so that I can make the report as it is required.

I would also like to address my parents support and prayers for me that helped me to continue with my work patiently and without their help in every possible way I could not have come to the end of this Internship. Finally I must express my cordial gratitude to all my faculty members to help me carry on with the whole bachelor's degree.

Letter of Transmittal

January 19, 2023

Sanzar Adnan Alam

Lecturer, Department of Computer Science and Engineering, Independent University, Bangladesh.

Subject: Submission of Internship report.

Dear Sir,
With due respect I would like to state that I am submitting my Internship Report to you. I have started working with Techno Drugs Ltd. for a 3 month long period of time as a software development intern. I would like to inform you that I have worked on "Portfolio" for Techno Drugs Ltd. and made this report based on my work experience and under your supervision. I would be ever grateful to you if you would kindly evaluate my report.

I therefore pray and hope that your honor would be kind enough to grant my application and oblige thereby.

Yours Sincerely,
Rubayat Islam Toma
ID: 1720579

Abstract

"Portfolio" is a software inspired by different ongoing similar projects and modified for Techno Drugs Ltd. as per the requirements of the company. This system is integrated with an in-built employee management system that helps all the employees to be supervised in an online platform which is a must require option for any business during this pandemic situation and also for regular times.

The system keeps records of all the assets of the company in a personal recording manner. This helps to get the view of assets to the management as they want to see it. Technologies used to build this software are very familiar to the current world. So maintenance or upgrading of the system in future will be easy.

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Chapter 1

Introduction

Internships are often very closely related to a student's academic and career goals. The purpose of the internship program is to help students focus on their career interests and potentials. The whole program is entitled to give the opportunity to learn, observe and determine their goals and aims. Internship provides a student an opportunity to relate their theoretical knowledge with the tough real world environments. Engineering, Technology & Sciences, a school under Independent University, Bangladesh offers undergraduate programs in "Computer Science and Engineering". As a student of the undergraduate program, the program requires that we complete an Internship Program with a reputable company where I will be trained practically with working environment practices and get familiar with the industry. I worked at a company named "Techno Drugs Ltd" where I completed 3 months of my internship period. In this report, I have discussed my internship period at "Techno Drugs Ltd" , an overview of the work I have done, my experiences working for a reputed organization, what I have learned and how it has helped me to develop and grow with a professional way.

1.1 Overview/ Background of the Work

Being an intern, the main challenge was to translate the theoretical concepts into real life experience. I started my Internship as a Junior Software Engineer at Techno Drugs Ltd Company on 11 October 2022. Techno Drugs Ltd gave me the opportunity to work on the Personal Portfolio website.

Everything is in one place and not scattered across various social media platforms. Creating a digital portfolio is like combining Instagram, LinkedIn, Deviant Art page and resume, and choosing the most important, impressive information. People interested in work – from supporters to potential clients and future employers – will be able to carry out a quick background check and get everything they need in one place. And that's only the beginning.

It's Improves Chances of Gaining Customers safe to say that anyone can benefit from having a personal website, but some career paths call for it.

1.2 Objectives

Project objectives are what we plan to achieve by the end of our project. Objective of a project is specific, measurable and must meet time, budget and most importantly meet the client's requirements. The main objectives of this application are described below:

A portfolio website is a unique way to showcase someone's work and let others know about themself. It's like an evergreen platform for their projects, case studies, and information about them. In addition, it's one of the best ways to express someone's personality, experience, and capabilities.

1. Tells Someone's Professional Narrative In A Compelling Way
2. Generates Credibility
3. Offers A Reminder Of a person's Outstanding Achievements
4. Helps Potential Clients Visualize Working With
5. Sets a person Apart, Especially An Online Version
6. Gives A Chance To Show someone's Creativity
7. Provides A Strong Supplement To Their Verbal Skills
8. Demonstrates Consistency
9. Improves Chances Of Gaining Customers

1.3 Scopes

A career portfolio can help illustrate a person's professional accomplishments, talents, abilities, activities, and attitudes to prospective employers. The career portfolio also serves as a marketing tool, offering employers a preview of his performance as a potential employee.

- **Showcase skills**:

  No matter how someone's academic background showcasing his skills is essential. From a history major with killer writing and researching skills to an *architecture major with impressive sketching abilities*, *everyone has content to fill* personal portfolio websites. The first step to building a portfolio is identifying exactly what his most valuable skills are, in addition to his biggest interests and passions. Remember, a portfolio doesn't necessarily have to reflect his degree or coursework. However, it *should* reflect how he sees himself and showcase some of his best work to date.

Ideally, it will also tell people slightly more about him than they might find on his profile.

- **Add a personal touch:**

  Personal portfolio websites are a perfect way to add a bit of personalization to a job application. While all applicants likely have a stellar CV and a solid recommendation, a portfolio sets a person apart. Additionally, this portfolio is a great way to demonstrate his personality and extracurricular interests and to showcase his creative side.

- **Build a person's brand online:**

  As a person continues to grow as a professional and expand further into his career, personal branding becomes essential. With an online portfolio, blog or website, he can effectively build the basis of his personal brand online. This site will be the first thing someone sees when they Google your name and will dictate their virtual first impression of him. Maybe a person's degree is in mechanical engineering but you're really passionate about sustainable energy. His online brand is the best tool to help him break into a new field, and will be extremely effective in driving his career forward.

Chapter 2

Literature Review

A literature review is a comprehensive summary of previous research on a topic. The literature review surveys scholarly articles, books, and other sources relevant to a particular area of research. In other words, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such case, the review usually precedes the methodology and results sections of the work.

2.1 Relationship with Undergraduate Studies

Knowledge and skills gained from undergraduate courses have helped in the development of the "Personal Portfolio Website" project. It would have proven more difficult if these courses were not covered before working on this project. Some of the courses are:

2.1.1 Data Structure:

This course was about teaching how to handle and manipulate complex arrays, objects, classes, array of objects, objects of array, nested arrays, nested objects, etc.
As "Personal Portfolio Website" involves many complex data structures, the skills gained from this course made handling them much easier.

2.1.2 Object-Oriented Programming:

This course is a deep dive into classes and its objects of programming. It also taught how to write modular programs which made codes less repetitive and more reusable. It helped to design "Personal Portfolio Website" code in a modular format. Also, as the application grew bigger, this practice helped avoid writing new modules from scratch by using parts of old modules and adding new functions to them.

2.1.3 Database Management:

This was the first course which taught how to design and plan a project. It covered popular planning and strategy practices such as System Development Life Cycle, Rich Picture, Requirement Analysis, Entity Relationship Diagram, Business Process Model and Notation Diagram and many more.

These techniques helped in the development planning and strategy of "Personal Portfolio Website"

2.1.4 System Analysis and Design:

This course introduced the tools and techniques for the design and analysis 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 and implementation, application architecture, user interface design, Front-end and backend design, database design, software management and hardware selection, Case studies of Information Systems. All these lessons helped to land the final project.

2.1.5 Web Applications and Internet:

This is the course where the development of web applications was taught. It covered very important technologies that are highly in demand in the industry, such as HTML, *CSS*, *Bootstrap*, *JavaScript*, *PHP*, *jQuery*, *View Engines (Handlebars and embedded* JavaScript), Node.js, Express.js, and MongoDB. The tools and technologies learned from this course immensely contributed to the development of "Personal Portfolio Website" as it is a web application built with the web technologies and it has a backend server which had to be deployed to the server as well.

2.2 Related works

Most of the landing pages use simple HTML, CSS, Bootstrap, JavaScript, or JQuery for their development. Most of the time, WordPress is used to remove any level of hard coding or to speed the development. As our goal for this project is to develop the web server, we used more complex development frameworks. It is challenging to find a related website that has used similar web technologies to our project. Some websites in the industry are stated below:

- **ThemeForest:** One can choose from over 700 *personal website* templates on ThemeForest, created by our global community of independent designers and developers.

- **Medium:** Best Practices for Portfolio Website Designs. Brand a person and use consistent logos and colors to identify his name and his skills amongst.

- **Awwwards:** A *portfolio website* can cover a lot of bases. Generally speaking, professionals, agencies, freelancers and artists require a creative medium to display.

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

Work Breakdown Structure is a way of finishing a complex, sophisticated and multi phased project into dividing into smaller portions and getting tasks completed by specific people. This helps us to divide and conquer a large project and complete the project fast and efficiently. Its main purpose is to make a huge project more manageable by breaking it down into small segments and assigned to different team members to collaborate and simultaneously work together. This yields better group productivity and efficient project management.

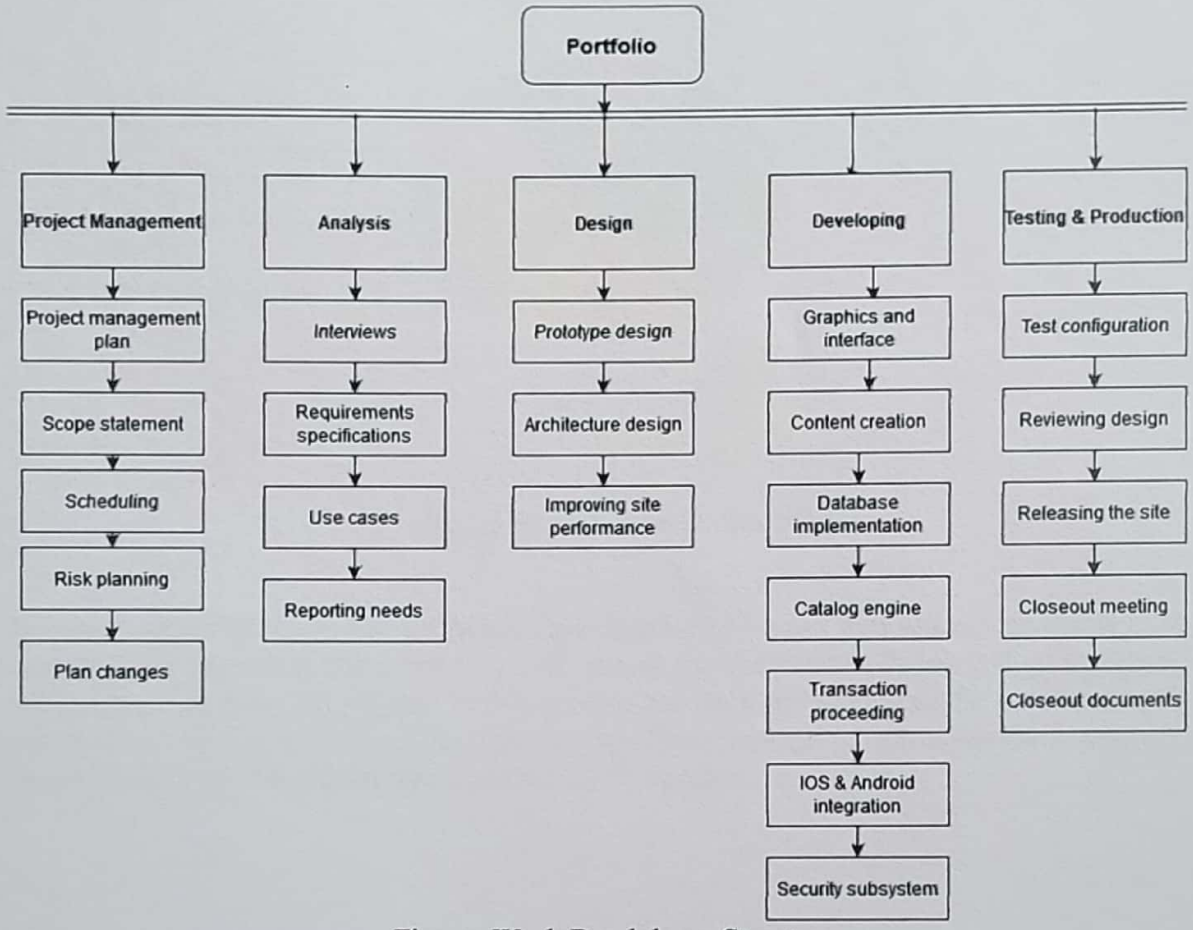


Figure: Work Breakdown Structure

Team members assigned to the project are actively involved in development to ensure consistency and high productivity. We can get a visual and hierarchical overview of the project and how each team member is going to work for the project. This provides us with clarity and accurate understanding of the scope of work.

3.2 Process/Activity wise Time Distribution

The Process wise time distribution is an estimated time management planning that determines how much time will be required to successfully develop and finish a project in a given time. This creates a conceptual mapping of how efficiently team members have to work in order to complete a project and meet all the milestones and deadlines. It plays an important role in project management.

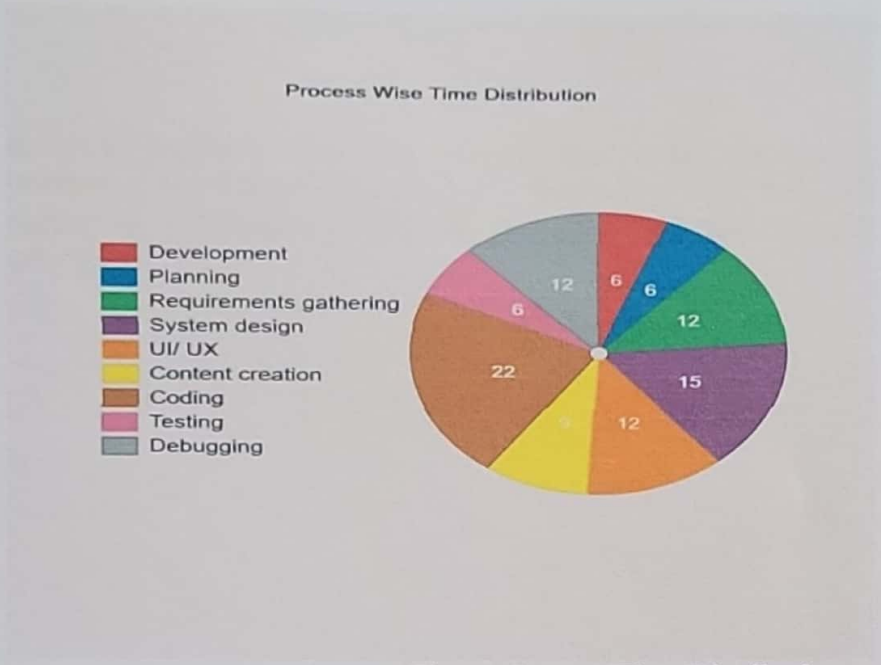


Figure: Process Time Distribution

In this chart we can see the Software Development Phases that we will go through to successfully complete the project. It also shows the list of phases we will go through with respect to time. All phases in this project are denoted with specific color and percentage. The percentage (%) denotes the Time needed to complete each segment of the project on the total time allocated for the project.

3.3 Process/Activity wise Resource Allocation & Estimated Costing

In project management, resource allocation is used to show or tabulate the schedule of activities and the resources that we will be needing to perform those activities by taking the resource availability and cost of the resources to account. It helps us to select the most preferable resources that are available to us for our project and manage them as we work.

Work Distribution	Costing
Front-End Development	7000
Back-End Development	13000
Hosting	10000
Miscellaneous Expenses	20000
Total	32000

In this figure we can see that, we have categorized the resources that are essential and necessary for our project mentioning their name and description of why we need it, mentioned their availability locally and estimated cost for each resource monthly and yearly.

Chapter 4

Methodology

Software Development Methodology is a process or a series of process in an organized manner or arrangement of procedures used in software development field to develop software by dividing the development work into smaller, parallel, or sequential steps to reduce time and follow a discipline to development process.[2] It is a very wide and enormous topic, it consists of certain phases to like Planning, Defining Requirements, Designing, Developing, Testing, Deployment and Maintenance. It defines how software should be built and what discipline should be followed to produce a fruitful outcome in a given time.

There are different types of software development methodologies and practices, that include:

1. Agile
2. Waterfall
3. Spiral
4. Prototype
5. Iterative
6. Incremental
7. Scrum
8. Rapid Application Development
9. Extreme Programming

For this software we have decided to choose the Agile methodology. It may sometimes take iterative development too.

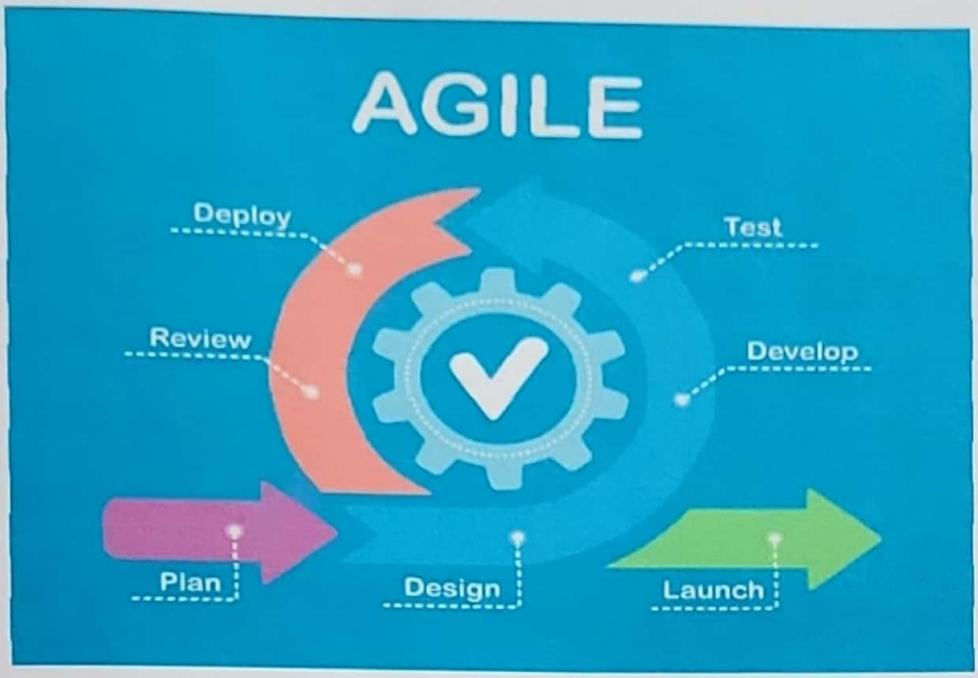


Figure: Agile Methodology

Agile is one of the most common and popular software development methodology. It mainly focuses on how to rapidly satisfy the customer and their requirements. In Agile methodology, all the tasks are broken down into smaller phases and requirements and solutions come through collaboration between different team members of a particular project and frequent improvements and iteration at all phases.

The reason we choose this methodology are:

1. Faster development time:
Agile follows an iterative discipline which means the outcome of the product is ready to be market faster, staying one step ahead of the competition and quickly getting its benefits. Agile methods reduce the development cost and time to release.

2. Flexible Control:
Since Agile methodology follows an incremental development, works and phases can be broken into smaller parts and performed in fast and iterative cycles. This allows team members of the project to share progress and address problems and develop a solution *through daily meetings, this creates transparency to the whole process.*

2. **Productivity and Quality:**

The Agile method follows the incremental nature which means that projects are finished in short phases, making them more manageable. It helps the project to be rolled out fast and development changes can be made at any time. It also has the ability to detect problems and develop a solution fast and efficiently which allows team members to get customer reaction and give feedback and continuously improve the software.

4. Customer Satisfaction:

Regular meetings and collaboration between team members and customer reactions will helps us provide quick feedback, this will allow us to make significant changes that will help to meet customers' expectations and demands through the development lifecycle. This results in happy and satisfied customers.

Chapter 5

Body of the Project

The body of the project contains all the detailed analysis and study of the project and the application that we are building. It contains a detailed explanation of the project, its workflow and architecture, application requirements and process, design and outlook of the project. It is the heart of the project that helps us clearly understand how the system will be built, the processes it will go through, what purpose it will serve and how it will look.

5.1 Work Description:

A personal portfolio is an evidentiary document designed to provide qualitative and quantitative information. It is different from a resume in that its intent is not to summarize, but to expand upon and provide evidence relating to accomplishments, skills and experience.

First, one needs a website to display the portfolio. To create a website we need a website builder. We should select a domain name, as it represents the portfolio to the client and give them a clear visualisation. Web design will either encourage potential clients to stay or bounce from the website. To give the website a unique design we add some features. Displaying samples of our work or past projects is what tells prospects we've got the creativity, skills, and experience to deliver an excellent job. By creating a dedicated page on our website and title it Case Studies, Projects, or Portfolio, and highlight our best work. While we are setting up an attractive and client-worthy portfolio, we should be more conscious of the quality of our projects than the number we plan to display. Showcase only the samples that truly and efficiently represent your ability. Ensuring our portfolio is up to date with our most recent and best samples.

Call potential clients to action with important details that include key pages and website elements, such as:

Homepage

Our homepage is our website's landing page. We should grab your prospects' attention from the moment they land on our website.

A homepage that converts should include:

- A clear message and image in the hero section
- A short section about who we are
- What services we offer
- Social proof banners or client testimonials
- Resources we offer (for example, a blog, guide, or an email list)

About Page

The About page is where we talk about our brand and how we can help our audience. Explain in clear detail:

- Who we are
- What we do
- Whom we do it for
- Why we do it

With our About page, we have the chance to convert prospects into paying clients.

Services Page

A Services page empowers us to explain more about what we offer, the process of working with us, and exactly what a client gets for their money.

We can decide whether or not to display our rates.

Social Proof and Client Testimonials

Credibility is not only a vital element when it comes to learning how to create a portfolio. It's necessary for business marketing, as 79% of customers trust online reviews.

Displaying genuine social proof and client testimonials on your portfolio are quick ways to:

- Earn trust in our industry
- *Land paying clients*
- Know our worth and price our offers accordingly

Contact Information

One of the main points of learning how to create a portfolio for our portfolio is getting prospects to look around, get impressed, and ultimately, pay us to help them.

So, we should make it easy for them to contact us.

Get Feedback

It's often difficult to be objective about our creations. The best way to get an unbiased, critical, and constructive review is by asking others to take a look.

Ask our family, friends, colleagues, or past clients to give feedback on our online portfolio. However, be objective when considering their varying feedback because our online portfolio should represent our brand regardless of critical suggestions.

Show Our Work to the World

Now that we've learned how to create a portfolio for ourselves, it's time to hit publish and share our new website with the world.

5.2 System Analysis

In order to identify the purpose and objective of a system, we need to conduct a system analysis by studying the system and its part to fully understand its purpose. It is the process of gathering and interpreting facts, identifying its problems and decomposition the system into its components. Its main purpose is conducting a study of the system and its parts in order to find its true purpose and objectives. It is a problem-solving technique that improves the system and ensures that all the components of the system work smoothly and effectively to serve its purpose.

5.2.1 Six Element Analysis

Process	Human	Non-Computing hardware	Computing hardware	Software	Database	Network & Communication
Browsing website	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Sign Up/ Login	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Admin Dashboard	Admin	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Homepage	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
View Qualifications	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
View Publications	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
View Experiences	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
View Rating	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
View Feedback	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Take Appointment	Admin	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN

Contact Details	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Give Rating	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN
Logout	All Users	N/A	Laptop/ Phone	Google Chrome/ Firefox	DB2	WAN

Figure: Six Element Analysis of Personal Portfolio

5.2.2 Feasibility Analysis

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.

There are some main parts of feasibility analysis. They are –

1. Technical Feasibility: In technical feasibility, evaluation of the software, hardware and the other technical requirements of the proposed system are performed.

This evaluates the details of how we intend to deliver a product or service to customers. *Employees, think materials, transportation, where our business will be located, and the* technology that will be necessary to bring all this together. Personal Portfolio has been developed using the Laravel framework. The use of latest version of Laravel framework and the regular HTML, CSS, Bootstrap and JS helped to build a much efficient and faster website. Moreover, these technologies are very popular in the modern industry and are being used thoroughly with a growing community.

2. Operational Feasibility: Operational feasibility is a measure of how well a proposed system solves the problems and satisfies the system requirements identified during the *scope definition and problem analysis phase. It is dependent on human resources* available for the project and involves projecting whether the system will be used if it is developed and implemented. Personal Portfolio has been developed in such a way that it can be conducted very easily.

People will accept it without any doubt. It is a well-planned system. People of all ages will be able to use it. It reduces physical and technical hardships. Users need not have a lot of technical knowledge to run this system. Every instruction is very clear to the users. We hope this system will be able to fulfill the requirements of the users.

3. Economic Feasibility: In economic feasibility, costs and benefits are identified. It determines cash flow and assigns values to costs and benefits. Development costs and production costs are included in economic feasibility. If this system can reach for the users it will definitely bring benefits. On one hand it will reduce the costs of wasting human energy, pens and papers. On the other hand benefits will come depending on the uses.

5.2.3 Problem Solution Analysis

The main problem that a web developer has to deal with during the web development process is that the requirements are always changing. According to a poll done by Stack Overflow Developer, 33% of respondents contemplate developing a website with no specified requirements. Gathering requirements is critical before beginning to create any product.

The following is a solution to this problem:
- Describe the project's scope.
- Make no assumptions about what is required.
- Communication between teams is essential.
- Make a list of requirements.
- Clients should be involved from the start.

Project Management: Multitasking can sometimes lead to more problems than it is worth. As a result, a skilled planner is necessary to make the work flow smooth and structured. It was tough for me to follow the entire procedure, and on top of that, we are dealing with a pandemic, so everyone had to adapt to a new method, which caused the project to take longer than usual.

Adapting to current market trends: As technology improves, so does the number of users; nowadays, everyone is addicted to their smart-phones, so being mobile-first or mobile-only is a challenge. The solution is to keep up with market developments.

5.2.4 Effect and Constraints Analysis

Effect: As before when the software was not present. It was difficult for the people to keep track of the history and its verifications . The old system was to keep all details in a documented file. So, finding old histories and records about each client was hard and needed a lot of employers. For this reason, software is built to solve this issue. As the data is stored in the database, everything can be queried from the newly built software in a cloud. There will be no more shortages of manpower to go through all of the documents and keep track of everything the process in software.

Constraint: There are many difficulties while finding a solution for this software. The old system was tried for a while, but the manual process takes longer. The cost for the overall process was higher and the amount was not fixed. But for the current software, a certain amount of money has to be spent on the hosting, domain, etc. At first, the budget of the software was a problem for the software but later there were some changes that took place and minimized a few functions and workload for the software to meet up with the budget. This software was effective for the company. It saves time and extra money.

5.3 System Design

Systems design is the process of defining elements of a system like modules, architecture, components and their interfaces and data for a system based on the specified requirements. It is the process of defining, developing and designing systems which satisfies the specific needs and requirements of a business or organization.

5.3.1 Rich Picture

A rich picture is a drawing of a situation that illustrates the main elements and relationships that need to be considered in trying to intervene in order to create some improvement. It consists of pictures, text, symbols and icons, which are all used to illustrate the situation graphically. A rich picture helps us to see relationships and connections that we may otherwise miss. It helps identify one or more themes participants may want to further explore and address. Rich pictures are therefore always used in the pre-analysis phase.

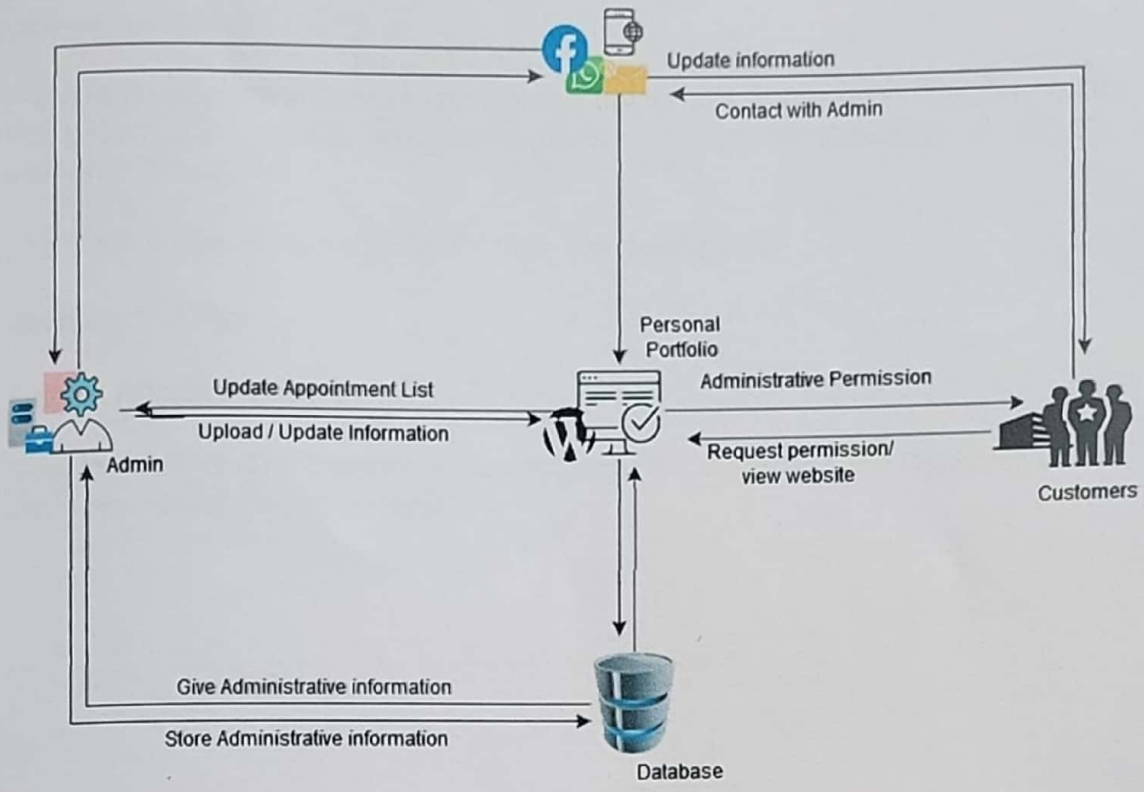


Figure: Rich Picture

5.3.2 UML Diagrams

A UML diagram is a diagram based on the UML (Unified Modeling Language) with the purpose of visually representing a system along with its main actors, roles, actions, artifacts or classes, in order to better understand, alter, maintain, or document information about the system. UML diagrams can be used as a way to visualize a project before it takes place or as documentation for a project afterward. But the overall goal of UML diagrams is to allow teams to visualize how a project is or will be working, and they can be used in any field.

Use case diagram:

A use case diagram is a way to summarize details of a system and the users within that system. It is generally shown as a graphic depiction of interactions among different elements in a system.

Use Case diagrams of Personal Portfolio are given below:

Module- 1: Login

Actors: Admin, All Users

Goal in context: The diagram shown in figure: 5.3 represents the Registration and Login process of Personal Portfolio.

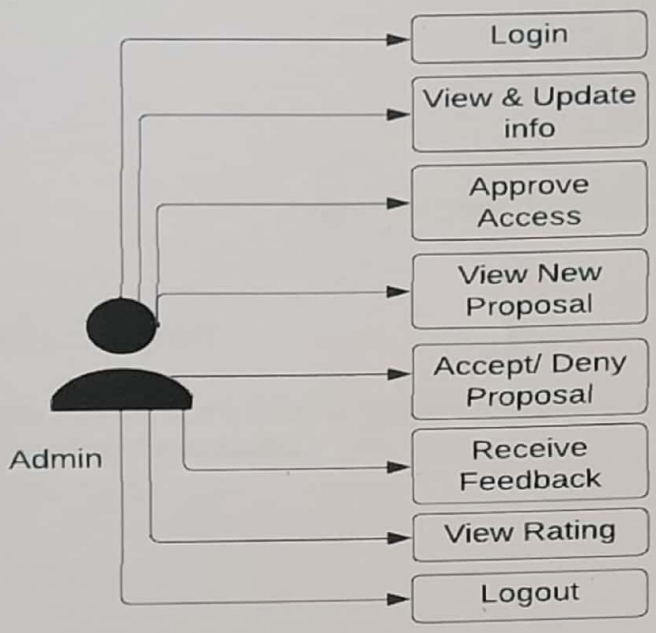


Figure: Admin Use Case Diagram

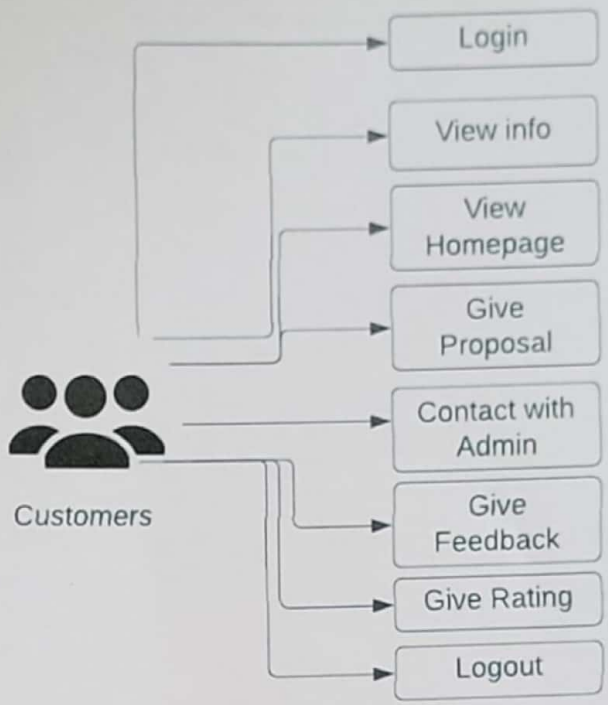


Figure: Customer Use Case Diagram

5.3.3 Activity Diagram:

An activity diagram shows how the flow of activities runs through in software. Following is an activity diagram for the software.

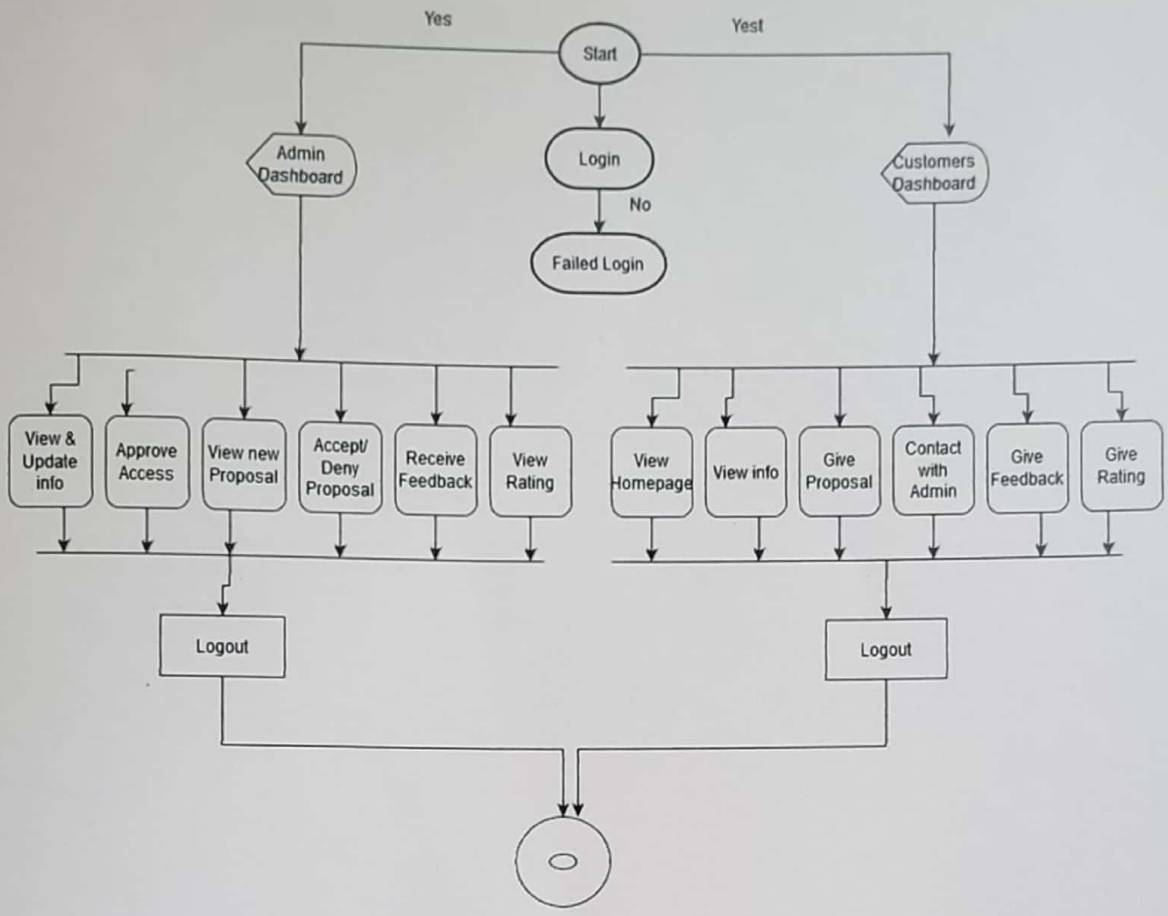


Figure: Activity Diagram

5.3.4 Entity Relationship Diagram:

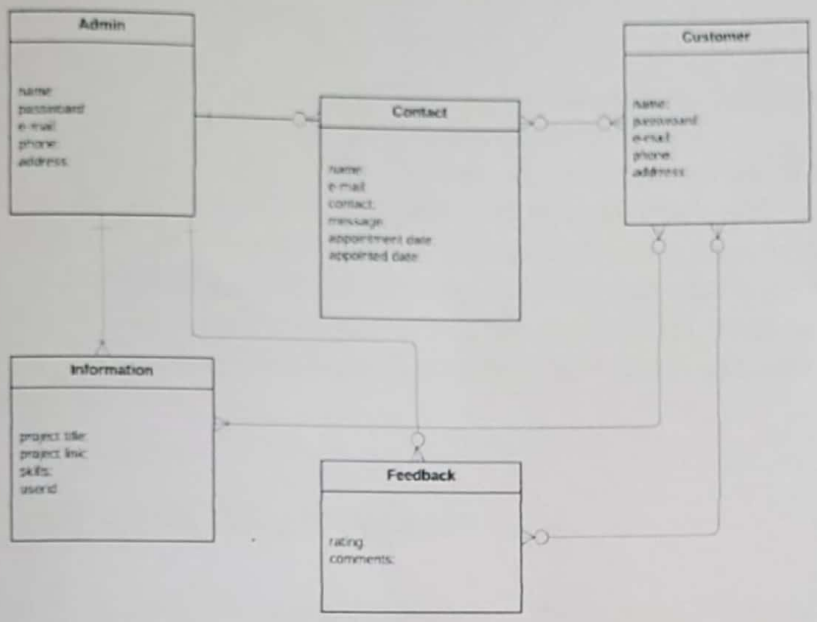


Figure: ERD

5.3.5 Functional and Non-Functional Requirements

Functional Requirements

A functional requirement is a function or feature that must be included in an information system to satisfy the business need and be acceptable to the users. The functional requirements for this project are:

- **Login:** *Only intended people can log into the system. An admin login system* and another one is for the employees of the company.
- **View & Update Info:** Admin can view & update all the information
- **View New Proposal:** All the new proposals are only visible to the admin.
- **Accept/ Deny Proposal:** Admin & customers can accept or deny proposals
- **Receive Feedback:** Admin receives feedback from the customers.
- **View Rating:** Admin and customers can view ratings given by the customers.
- **View Info from the Website:** Customers and admin can view info from the website.

Non-Functional Requirements

A nonfunctional requirement is a description of the features, characteristics, and attributes of the system as well as any constraints that may limit the boundaries of the proposed solution. The non-functional requirements for the project are given below:

- **Performance:** The system will provide better performance. Performance requirement represents the performance. The system is required to exhibit to meet the needs of users. The response time of the system should be quicker to save time.

- **Information:** Information is an important resource. It represents the information that is pertinent to the users in terms of content, time accuracy and format. All the information will be kept in the database.

- **Control and Security:** The information will be automatically saved in the database. The control unit of accessing the details is the administrator of the software. It ensures data accuracy and data security.

- **Availability:** It is online software. So it can be accessed anytime from anywhere.

- **Usability:** The software is quite user friendly.

Chapter 6

Results & Analysis

While testing the program, there were several issues. This was a minor issue that we were able to resolve. After the resolving of these issues, test cases were documented. Testing methodologies have been used to justify all test cases. We did our testing on a local server. We'll test everything on the hosting site again after it goes online. As a result, various modifications may occur at that time. There are few integration's possible. But it will be added in the future. So, all the tastings are not done. But up to the current feature available, all the testing is done, and it is running fine.

Software Testing:

Software testing determines the safety, accuracy, and quality of new software. Approval refers to the process of verifying that the generated computer software fits the clients' requirements. The main goal of software testing is to find bugs in the program.

The figure below shows the results of tasks that I have worked on. Each of the tasks is only provided if and only if it meets the requirements successfully.

Result Table for Admin

Test Case	***Input Test***	***Steps Performed***	***Expected Result***	***Actual Result***	***Success Rate***	***Pass/Fail***
User Login	User Id, Password	1. Enter UserId & Password 2. Click on Login	Will be redirected to Dashboard	Redirected to Dashboard	100%	Pass
Add Users	Name, E-mail, Password, Address, Phone number, User type	1. Click on Add New User 2. Enter User Information 3. Click	Add new user success message will be displayed	Success message was displayed	100%	Pass

		on Signup				
Add Leads	Company Name, Company Address,Company E-mail, Company Zip Code, Company Website & Country, Contact Name, Contact Phone number, Contact Designation, Lead Source, Lead Assigned Employee, Lead Message, Lead Status	1. Click on Add New Lead 2. Enter New Lead 3. Click on Save	Add new Lead success message will be displayed	Add new Lead success message was displayed	100%	Pass
Remove Leads	N/A	1. Click on Lead Tab 2. Select Specific Lead 3. Click on Remove	Specific Lead will no longer be displayed	Specific Lead was no longer be displayed	100%	Pass
Edit Leads	Company Name, Company Address,Company E-mail, Company Zip Code, Company Website & Country, Contact Name, Contact Phone number, Contact Designation, Lead Source, Lead Assigned Employee, Lead Message,	1. Click on Lead Tab 2. Select Specific Lead 3. Click on Edit 4. Enter New Information 5. Click on Save	Specific Lead will be updated with new information	Specific Lead was updated with new information	100%	Pass

	Lead Status					
Display Leads	N/A	1. Click on Lead Tab	Correct Lead will be displayed from database	Correct Lead was displayed from database	100%	Pass
Add Work	Name, Programme Category, Language, Status	1. Click on Add New Work 2. Enter Work Information 3. Click on Save	Add new Work success message will be displayed	Add new Work success message was displayed	100%	Pass
Edit Work	Name, Programme Category, Language, Status	6. Click on Work Tab 7. Select Specific Work 8. Click on Edit 9. Enter New Information 10. Click on Save	Specific Work will be updated with new information	Specific Work was updated with new information	100%	Pass
Remove Work	N/A	4. Click on Work Tab 5. Select Specific Work 6. Click on Remove	Specific Work will no longer be displayed	Specific Work was no longer be displayed	100%	Pass
Display Work	N/A	1. Click on Work Tab	Correct Work will be displayed from database	Correct Work was displayed from database	100%	Pass
Display Appointments	N/A	1. Click on Appointments tab	Correct Appointments will be displayed from database	Correct Appointments was displayed from database	100%	Pass
Display Proposals	N/A	1. Click on Propos	Correct Proposals will be displayed	Correct Proposals was	100%	Pass

		als tab	from database	displayed from database		
Display Dashboard	N/A	1. Click on Dashboard tab	Correct Active Lead, Proposals,Work will be displayed from database	Correct Active Lead, Proposals,Work was displayed from database	100%	Pass

Figure: Result Table for Admin

Result From Management Panel:

Test Case	Input Test	Steps Performed	Expected Result	Actual Result	Success Rate	Pass / Fail
User Login	UserId, Password	1. Enter UserID & Password 2. Click to Login	Will be redirected to Dashboard	Redirected to Dashboard	100%	Pass
Add Customers	Customers Name, Phone Number, Address, Customers Zip Code, Billing Code, Customers project	1. Click to Add New Customers 2. Enter Customers Informations 3. Click to Save	Add new Customer success message will be displayed	Success message was displayed	100%	Pass
Edit Customers	Customers Name, Phone Number, Address, Customers Zip Code, Billing Code, Customers project	1. Click on Customers Tab 2. Select Specific Customers 3. Click on Edit	Specific Customers Information will be updated	Specific Customers Information was updated	100%	Pass

		4. Enter New Information 5. Click on Save				
Remove Customers	N/A	1. Click on Customer tab 2. Select Specific Customer 3. Click on Remove	Specific Customer will no longer be displayed	Specific Customer was no longer displayed	100%	Pass
Display Customers	N/A	1. Click on Customer Tab	Correct Customer will be displayed	Correct Customer was displayed from Database	100%	Pass
Add Appointments	Appointment Date,Appointment with, Subject, Message	1. Click on Add New Appointments 2. Enter Appointment Information 3. *Click on* Save	Add New Appointment success message will be displayed	New Appointment success message was displayed	100%	Pass
Remove Appointments	N/A	1. Click on Appointment Tab 2. Select Specific Appointment 3. Click on Remove	Specific Appointment will no longer be displayed	Specific Appointment was no longer displayed	100%	Pass

Figure: Result Table for Management Panel

Chapter 7

Project as Engineering Problem Analysis

Engineering problem analysis is the internal guidance of a project. It can be described as the breaking down of sustainability, social and environmental effects and analysis, ethics and ethical issues into its basic elements to get at its essential features and their relationships to each other and to external elements.

7.1 Sustainability of the Project

Sustainability of the product refers to its ability to be maintained and updated. In the In the modern world, every application being released needs to be maintained and continuously updated for its user base.

In today's world most people from all classes drastically use smart-phones. Smartphones and the internet make people's lives easier. People are now searching for an easy solution to every situation which reduces the daily life hassles. So, people get more dependent on online based solutions.

A product can be sustainable in three main categories:

• **Community Sustainability:** After the deployment and official release of personal portfolio, it is believed that it will have a strong user base since the target audience for the system is specifically narrow and concise. We can expect the users to refer to other users regarding the application and thus growing the user base. With a growing user base, it will also grow a community and hence it can be said that it is Sustainable in terms of Community.

• **Financial Sustainability:** This refers to how the application's running cost will be maintained after it has been released and whether it will generate enough revenue as acceptable profit. An application's running cost includes - server cost, database storage cost, third party API cost, etc. The initial release of Personal Portfolio won't have any fees to use but as the user base grows there are plans to introduce new premium services which will eventually be used to generate revenue.

• **Organizational Sustainability:** It relates to how the organization will continue to operate after the release of the application. After the release of an application, usually the organization maintains the application via its current team, an extended team or by a fresh new team. Also, organizations update their project by adding newer features to it and organization may pivot to other projects, expand the teams, create new teams, etc. Personal Portfolio has many more features planned for the future to be worked on and released. Since the application has further plans, the project will be maintained and updated after its release as well and release premium services to it. In conclusion, it can be said that the project is organizationally sustainable.

7.2 Social and Environmental Effects and Analysis

7.2.1 Social Effect:

For young professionals, launching personal portfolio websites is one of the best things to do for their careers. While this might seem like a big endeavour, this is actually an easy task that will make a huge difference in professional endeavours. No matter where a person is in his career or his degree, set aside the time to put his profile online. Whether he has a hundred work samples or just a few projects done for class, it's time to get started. Once he launches his personal portfolio website, the opportunities are endless. Depending on his interests and career field, his portfolio will look slightly different from that of other peers.

7.2.2 Environmental Effects:

This growing interest in impact investing shows that investors are becoming increasingly socially and environmentally conscious and aligning their investment choices with their personal values. This mindset is not limited to aspiring or seasoned impact investors; traditional investors are also calling for greater transparency about the impact of investments within a portfolio.

When investors and wealth management firms describe investments as having an impact, typically they are referring to a positive social and environmental effect. Portfolio is a compilation of academic and professional materials that exemplifies your beliefs, skills, qualifications, education, training, and experiences. It provides insight into your personality and work ethic. Consumers need not have to wait for a particular person to do a work; rather they can appoint their work online after reviewing a website within minutes. They can also give feedback about their work.

7.3 Addressing Ethics and Ethical Issues

In this era of technology trying to be someone has become very easy, without knowing someone can try to impersonate you and use your credential to do illegal or commit any crime. It became vital to keep user data securely otherwise someone can easily attack the system and take user information.

Fraud and Identity Theft: The website does not allow any other third-party software to the database. Data is from what the user provides no other information is stored. This system does not have a payment gate-way, so users will not be required to give any bank account or card information.

Data Security: Only the head developer will have access to the server and the database system. Database is secured with username and password, without this logging information no one else can have access to the data collection.

No Discrimination: there is any discrimination of any kind based on race, sexuality, gender, religious beliefs, color, language, political or other opinion, national or social origin, property, birth, or other status.

Chapter 8

Lesson Learned

During my internship program, I have learned about different types of Customer Relationship Management System, how they work, the user interfaces, workflow of the system, how data is manipulated, what data fields are necessary. What technologies are being used for this type of software? Read through a few journal papers to understand the current research or development stages of CRM software. Studied some benefits and advantages of Personal Portfolio Website software, how it will help to improve people's lives and easier to use. I have discovered that Sales force and HubSpot have a very complicated system, yet are very beneficial and productive. Recent research papers suggest people are trying their very best to reduce the complexity of the system and looking for a simpler interface.

Learned about different types of Software Development Life Cycles, mainly the AgileMethodology, when we should use it, what are the benefits of it. What is Work Breakdown Structure? How it is beneficial for Software Development, created WBS using lucidchart. What are Gantt Charts? Created Gantt Charts using Excel. What is Activity wise Time Distribution? What is Resource allocation, how it is beneficial for business and software development.

Learned about System Analysis, Six Element Analysis, Feasibility Analysis, Problem Solutions, Effect and Constraints Analysis. How it is beneficial for software development. Created a Rich Picture using Adobe Illustrator. What are Use Case Diagrams? How it is beneficial. Created diagrams using LucidChart. What are Activity Diagrams? Created diagrams using LucidChart. What are Entity Relationship Diagrams? Created ER Diagrams using LucidChart. What are Functional and Non-Functional Requirements? What is Model View Controller Architecture, how it works, how it is beneficial for the system. How all of the analyses are connected and helpful for the development process.

Learned about modern day technologies used for Web App Development. How JavaScript can easily communicate with both client side and server side in a web app, how it makes web apps much faster, efficient and scalable. Explored different types of popular JavaScript libraries and framework, Node.js and Express.js used for middleware, where express is a framework used to communicate with node, a popular server platform, how both makes a web app fast, opinionated and minimalist, how it effectively and easily handle http requests and responses and provide powerful URL routings, how it can incorporate with front ends like ejs, html, css by calling GET and POST methods, how it incorporates with MongoDB and Mongoose to easily store data, it is highly scalable and document based database, that store data in JSON structure.

This together makes the data flow from front to back end, natural and fast. Explored EJS, how to reduce code by reusing it, how it can be used to render pages dynamically and load data in response to URL requests. Learned about testing in minimal, mostly about Blackbox testing and how to represent results of testing.

Learned about different types of problems faced in an organization when introducing new software, studied about social effects, environmental effects, ethical problems and sustainability of software. How it can create impacts and ways to resolve it.

8.1Problems Faced During this Period

Some of the problems that I have faced during this Internship Program is mostly managing time properly and scheduling work and maintaining the deadlines. It wasn't easy developing the software, learning, and adapting to the new technology parallelly at the same time.

In addition to the system planning, project management, system analysis and system design, a lot of proper thinking, analysis and best judgment calls were necessary to meet deadlines, balance work and make an overall good and solid system plan.

Collaborative work can require good patience and communication skills, clearly understanding the client's needs and requirements, how effectively it will serve its purpose and be beneficial for the organization. How working with a team can require synchronization, group planning and understanding between team members and integrating phases milestones together to successfully complete segments of the project and maintain project management timeline.

Adapting to the new technology, it can be challenging in a very short time. It takes an average of 3-6 months to learn about a new programming language. Even though I had some pre-existing knowledge about programming, it takes a lot of time to learn the basics of a new language or framework, practising it and understanding it. Some of the major problems that I have faced were debugging the software when in production. It can be very challenging when something doesn't work and have absolutely no idea where it is going wrong, a lot of researching, judgement calls and learning new techniques and methods to resolve them.

8.2 Solution of those Problems

To encounter the problems I have faced during my internship. I have taken several approaches to get the solutions.

For Time management, I have followed one of the old and famous strategies "Divide and Conquer". It breaks down the problems into several segments or sub problems and does it in parallel and finally joins it. At the beginning of my Internship Program, I had basic to intermediate knowledge about Programming and Web App Development. But not about the new technology that I will be using. I have divided my time by learning the new technology framework, and side by side planning and collecting software requirements for the CRM software. Once I have finished learning the basics of new frameworks and collecting software requirements. I moved to the next phase by designing the UI/UX of the web app and creating the front-end portion of my software and parallelly creating the system designs like rich picture use case diagrams, activity diagrams and ERdiagrams and writing the functional and non-functional requirements at the same time. This parallel and divided work plan helped me to get the right thing at the right time. Now, I have an intermediate knowledge about the new technology and framework and the detailed analysis and design of the system. I am now fully equipped with the necessary and important documents and knowledge to start building the CRM software. In the next phase, I divided the software into modules and detected the common functionalities of the system and worked on them. I have estimated that, if I am able to complete the important functionalities of one module, then I am halfway to resolving my problems and building the App. Yet it seems very straight forward and perfectly planned. But I did face various challenges throughout this period between the phases; I had to do office work, meetings and discussion in between the phases. But with this strategy it helped me fasten my work to an extent and effective to a certain level.

During my entire Undergraduate journey in Independent University, Bangladesh. I have received help from several faculties and supervisors, their assistance, support, and corporations have helped me resolve many serious and critical problems while writing the report and building the App. I have learned and received knowledge and help from my supervisors both internal and external, guiding me and suggesting where I should focus, where my problems are, how I will be able to improve it and giving honest feedback and appreciations. These may seem simple, but it was highly beneficial for me throughout the journey. I have received several resources from various courses I have taken during my undergrad including, Object Oriented Programming, Database Management, System Analysis and Web App Development courses that were extremely knowledgeable, helpful, and resourceful for my Internship Program, and to grow as a good programmer. It has provided me with incredible resources that made my work faster, easier, and efficient. I still use some of these contents and resources on developing new software every day; these shall always remain a fortune to me throughout my life as a Programmer.

While adapting to the new technology and frameworks, I have faced various challenges I have mentioned above. It was by far the most difficult problem I faced and I had to resolve it with good judgement calls and researching about the frameworks, reading framework documentations, searching for problems in Google, Stack Overflow, watching tutorial videos, and most importantly practicing it and trying different things and harnessing my knowledge. Before I took the attempt to develop the CRM software, I had to have a clear and solid knowledge and practice of the new technology. I had to build several mini applications like Newsletter App, Weather App, Blogging App, To-Do List App and Simon Game for learning and practicing purposes. I had to go on several critical thinking phases and planning to finally understand and implement the CRM App using the new technologies.

Yet most of the problems that I have mentioned above are reasonable solutions, but there still remain some problems that are not easy to resolve with smart strategies and planning. Collaboration and Communication with team members were difficult, but I had to attend several important meetings and discussions in person, as it is not possible to do it from online calls. Some meetings were held for Software Requirements, System Design, Content Creation and UI/UX design that had to be physical and in person. Other minor meetings regarding company work were mainly discussed through video calls.

Chapter 9

Future Work & Conclusion

9.1 Future Works

Some of the future works for this software include:

- Data Analytical and Representations module will be implemented for Sales Statistics and Business Intelligence
- VC Dialer Integration
- Voice over Internet Protocol Service will be integrated
- Instant Messaging Service
- Data Mining and AI powered Lead Generator to produce new business insights and connections
- White Box Testing
- Convert Front End to React.js

9.2 Conclusion

I have given overall and detailed information about the Web App in this report. These include the background of the project, the objectives and what we want to achieve, how The Personal Portfolio Website system works, why we need it, how it is beneficial for the organization and how it is related to my undergraduate study in Independent University, Bangladesh. I have provided a rigorous Project Management and Financing plan, the methods that has used for developing the software, a broad section of my work description, analysis of the system and the system design for the project to understand the system, this involves the architecture, use cases, activity and entity relationship of the software, and how it is made and built. I have provided results from Blackbox testing, the problems that I have faced through this time and emphasized the importance of this App in Aristo Technology. This project consists of Front-end (UI/UX Design, HTML, CSS, JS, Bootstrap, and EJS) and Back-end with (MongoDB, Node.js and Express.js) was used for developing the software. These include Leads, Products and Sales Management for Admins and Customers, Appointment and Proposal Management for Sales Agents and Dashboard for both Admins and Sales Agents and everything that I have worked on during this time in my internship program.

In our software, the admin can add or post new leads to the system, add work that is required. Admins can also delete leads and products information, if necessary. Management panel will have the ability to see newly added leads, add new customers, set appointments with customers or companies, make proposals for both customers and companies, convert leads to customers if certain criteria are met, and they can also delete certain appointments, proposals, and customers if necessary. Management members and Admins both can see the total number of appointment dates, work, leads converted and proposals made.

Bibliography

[1] S. Vadlamudi, A. Islam, S. Hossain, A. A. A. Ahmed, and A. Asadullah, "Watermarking techniques for royalty accounts in content management websites for iot image association," Academy of Marketing Studies Journal, vol. 25, no. 4, pp. 1–9, 2021.

[2] N. Torkanfar, Semantic similarity measurement of construction projects using WBS-based similarity metrics. PhD thesis, 2019.

[3] C. K. Romi, Z. Abdallah, U. C. Johnson, and S. C. Lwanga, "Design and development of an examination and results management system: A case of the ict university,"

[4] M. Warner, P. Croal, B. Dalai-Clayton, and J. Knight, "Environmental impact assessment software in developing countries: a health warning," Project Appraisal, vol. 12, no. 2, pp. 127–130, 1997.