

2022-09-14

Web Application Development of "Research Lab"

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Independent University, Bangladesh

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An Undergraduate Internship/Project on Web Application

Development of "Research Lab"

By

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Summer, 2022

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September 14, 2022

Dissertation submitted in partial fulfillment for the degree of

Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

This is to certify that this report is completed by me, Sabrina Yasmin (ID-1821172), submitted in partial fulfillment of the requirement for the Degree of Computer Science and Engineering from Independent University, Bangladesh (IUB). It has been completed under the guidance of my Supervisor, Mr. Sanzar Adnan Alam. I also certify that all my work is original and is the result of my work experience in The Recreation IT.

Sabrina Yasmin

Signature

15/09/2022

Date

Sabrina Yasmin

Name

Acknowledgement

The internship opportunity I had with The Recreation IT was a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period. I am using this opportunity to express my deepest gratitude and special thanks to the CEO of The Recreation IT who in spite of being extraordinarily busy with his duties, took time out to hear, guided and allowed me to carry out my project at their esteemed organization.

I express my deepest thanks to my organizational supervisor, Kazi Md. Tarikul Imam for giving necessary advice and guidance. I choose this moment to acknowledge his contribution gratefully.

Sabrina Yasmin

September 7, 2022

Dhaka, Bangladesh

Letter of Transmittal

September 7, 2022

Sanzar Adnan Alam

Lecturer, Department of Computer Science and Engineering

Independent University, Bangladesh

Subject: Internship Report Submission

Dear Sir,

I have completed the Internship Report required to be submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science and Engineering. The report is based on my project - Web Application Development of "Research Lab".

I have worked with utmost dedication and have tried my level best to meet the needs of this course and follow all the guidelines given to prepare the report. The internship program has been really very helpful for me as it gave me an exposure to the world of practicality and I am sure it is going to help me perform in my career in future. I believe that this report will certainly help you in evaluating my project work.

I shall be gratified to answer any sort of queries regarding this report, assuring of my presence if and when needed. Sincerely gratitude for your illuminating guidance.

Sincerely,

Sabrina Yasmin

Evaluation Committee



.....
Signature

Mr. Sanzar Adnan Alam

.....
Name

.....
Supervisor

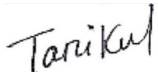


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Ms. Ajmiri Sabrina Khan

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Mr. Kazi Md. Tarikul Imam

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External Examiner / Organizational Supervisor / Panel Member-2



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Signature

Dr. Mahady Hasan

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Name

.....
Head of the Department / Convener

Abstract

I carried out my internship in the organization, The Recreation IT. During my internship period, I was assigned a project by my organizational supervisor. The project was to develop a web application for one of their clients who is a professor and needs a personal research lab portal so that he can share his expertise and knowledge with other people around the world. The main purpose of the research lab website is to provide information about his work. The website consists of the pages - Home, About, Team, Project, Contact, Search. The technologies used for development were Html, CSS, Bootstrap, PHP, MySQL. The website is easy to use as the user can easily navigate its interface and can quickly perform the tasks using phpMyAdmin Graphical User Interface (GUI). The system can be easily understood, changed, and tested. It is easy to correct a defect or modify the system.

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Chapter 1

Introduction

An internship is a trained and supervised experience in a professional environment in which the student learns and gains essential experience and expertise. Internships provide real world experience to those looking to explore or gain the relevant knowledge and skill required to enter into a particular career field. Internship is relatively short term in nature with primary focus on getting someone on the job training and taking what has been learned in the classroom and applying it to the real world.

I haven taken the course CSE499 as a requirement of my Bachelor of Computer Science and Engineering program at Independent University, Bangladesh. I started my internship as a web development intern on 6th June 2022 at The Recreation IT.

1.1 Overview/Background of the Work

My organizational supervisor, Kazi Md. Tarikul Imam has assigned me my internship project which is to develop a web application for one of their clients. The client is a professor who needs a personal research lab portal so that he can share his expertise and knowledge with other people around the world. The purpose of the research lab website is to provide information about his work. This website would be used as a tool for knowledge mobilization for his research projects and for publishing, sharing and collecting research information related to work being done by him.

A research lab website is a relatively small investment of time that can pay off in terms of career progress, giving researchers greater control over how their expertise is presented online. It can also help researchers to share resources with the community, and promote their work to the general public. It's also an important asset for researchers thinking about launching an independent career.

1.2 Objectives

The main objective of this project is to give a platform to the client where he can provide real time data or information and update the website as per his need.

Features of the project include:

- Content areas for information about the lab, research projects, lab team, and news updates
- Dynamic website hence user-friendly, allowing user to easily make changes to the website depending on his/her requirements
- Functionality, interactivity, and ease of editing gives the website a professional look

1.3 Scope

The website is dedicated to the client's research and development programs. It will consist of the following pages:

- Home - gives an overview of the website
- About - provides information about the lab
- Team - showcases the lab team.
- Project - showcases current and past projects
- Contact - Allows people to get in touch
- Search - To look for things within the content of the site
- News - Announces recent achievements or awards, Announces upcoming events, research outcomes etc.

Chapter 2

Literature Review

A literature review is a simple summary of the sources, but it usually has an organizational pattern and combines both summary and synthesis. A summary is a recap of the important information of the source, but a synthesis is a reorganization, or a reshuffling, of that information. It might give a new interpretation of old material or combine new with old interpretations. It may be used as background or context for a primary research project.

2.1 Relationship with Undergraduate Studies

The following courses helped me to understand and develop my project :

- CSE 303- Database Management: This course taught conventional and database approaches, Basic concepts of DBMS, Hierarchical, network and relational data models, Entity-relationship modeling, Relational database designing: decomposition and normalization, functional dependencies, Structured query language (SQL), Database programming with SQL, Specific database systems: oracle, MS SQL server, access.
- CSE 307 - System Analysis and Design: This course made me familiar with Systems and models; Project management; Tools for determining system requirements; data flow diagrams;; Systems analysis: systems development life cycle models. Object oriented analysis: use-case modeling, Unified 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.
- CSE 309- Web Applications and Internet: This course serves as a comprehensive overview of web technologies and their usage. Topics such as OSI & TCP/IP

architecture, IP addressing & Domain Name System, popular browsers, HTML and Cascading Style Sheet, HTTP, HTTPS, FTP, Client and Server side scripts, Scripting (JavaScript, AJAX, XML) with jQuery libraries, Web Servers (IIS, Apache), designing dynamic websites using ASP.NET with SQL server and PHP with My SQL were covered.

2.2 Related works

My web application will be using HTML, CSS, Bootstrap for frontend development and php and Mysql for backend development. Some of the websites in the industry that are similar to my web application are mentioned below.

- Nanomaterials Group (nano.mff.cuni.cz) - A non-traditional website design with great use of hexagons. Nanomaterials Group's website looks different from other labs. Visitors can easily navigate to their page of interest without even going through the navigation menu.[1]
- CERN (home.cern) - This website uses an exceptional mega menu that helps organize and simplify navigation.[1]
- Princeton Computational Lab (light.princeton.edu) - This is an informative website that aims to showcase their mission. Links to the latest news and related publications are easily accessible on the homepage.[1]
- Nectow Lab (nectowlab.org) - The website effectively used the homepage to communicate critical information while also making it a gateway to the rest of the site.[1]

Chapter 3

Project Management & Financing

3.1 Work Breakdown Structure

A work breakdown structure defines all the things a project needs to accomplish, organized into multiple levels, and displayed graphically. Below is the WBS of my project.

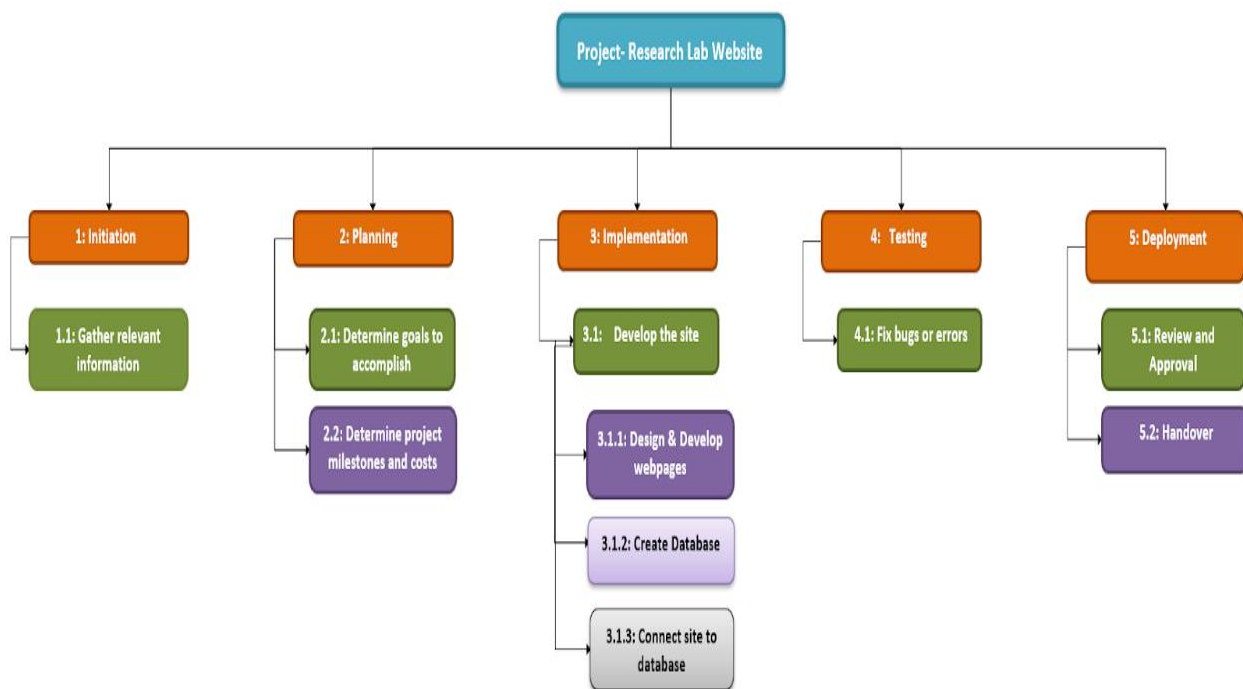


Fig 3.1: Work Breakdown Structure

3.2 Process/Activity wise Time Distribution

The below illustrations shows the Process/Activity wise Time Distribution of the project:

Table 3.2: Table for Process/Activity wise Time Distribution

Index	Process/Activity	Dependency	Duration
A	Initiation	None	7 days
B	Planning	A	7 days
C	Implementation	B	21 days
D	Testing	C	7 days
E	Deployment	D	2 days

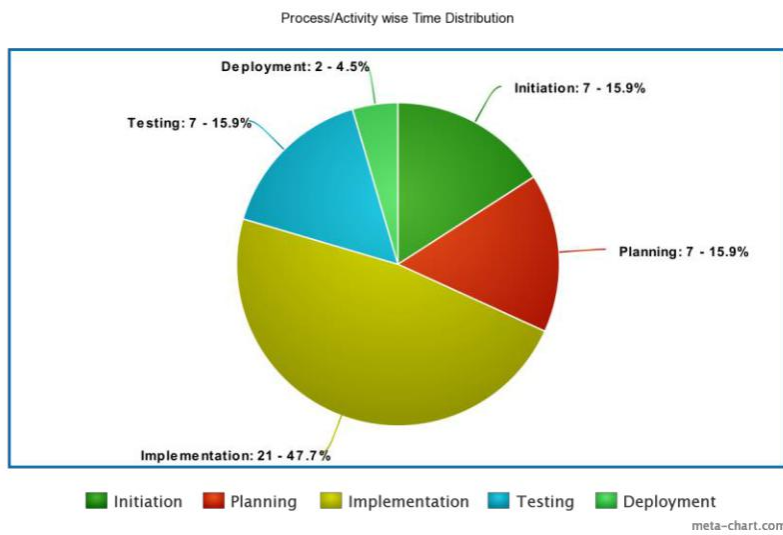


Fig 3.2: Process/Activity wise Time Distribution [7]

3.3 Gantt Chart

A Gantt chart is a bar chart that provides a visual view of project tasks scheduled over time. A Gantt chart is used for project planning: it's a useful way of showing what work is scheduled to be done on specific days. It helps project managers and team members view the start dates, end dates and milestones of a project schedule in one simple stacked bar chart.[2]



Fig 3.3: Gantt chart

3.4 Process/Activity wise Resource Allocation

Resource allocation is the process of assigning and managing assets in a manner that supports an organization's strategic goals. Resource allocation includes managing tangible assets such as hardware to make the best use of softer assets such as human capital. Resource allocation involves balancing competing needs and priorities and determining the most effective course of action in order to maximize the effective use of limited resources and gain the best return on investment.[3]

Table 3.4: Table for Process/Activity wise Resource Allocation

Category	Item	Item Description	Significance
Software	Microsoft Windows 10	A program that acts as an interface between the system hardware and the user making the tasks easier	High
	Visual studio code	Provides the tools for a quick code-build-debug cycle and leaves more complex workflows to fuller featured IDEs, such as Visual Studio IDE	High
	XAMPP	A platform that furnishes a suitable environment to test and verify the working of projects based on Apache, Perl, MySQL database, and PHP through the system of the host itself	High
	Mysql Database	Provides comprehensive support for application development need	High
Hardware	Laptop/PC	Required for doing work	High
Network	Internet connection	Required for connecting to internet	Medium

Chapter 4

Methodology

A web development methodology adds structure to website creation. They're convenient blueprints referenced to monitor progress. It describes the life cycle of the web development process to smoothen the workflow and meet project deadlines every time. Using the right web development methodology promotes efficiency as it identifies and prioritizes project goals early on in development. That means no one will be wasting time on irrelevant details, and the whole team works with the same goal in mind.

There are several web development methodologies, each with its own set of pros and cons. Choosing the right one depends on project requirements, team size, goals, available resources, and timeline, among others.[4] Below are some of the most popular web development methodologies.

- Waterfall
- Agile
- Scrum
- Extreme Programming
- Lean



Fig 4: Agile Methodology

For the project, Agile methodology has been chosen as it provides high product quality, higher customer satisfaction, better visibility into project performance, increased project control and reduced risks.

Other benefits of agile methodology are:

- Agile gives the flexibility to respond to market changes
- Agile helps distinguish needs from wants = better ROI
- Clients have the opportunity to give feedback throughout
- Agile keeps the focus on the end-user
- Costs are more easily controlled using Agile

Chapter 5

Body of the Project

5.1 Work Description

This website would give a platform to the client where he can provide real time data or information and update the website as per his need. The website is dedicated to the client's research and development programs. It will help him to share the resources with the community, and promote his work to the general public.

The website is dynamic and works in the following manner:

- Since the website is dynamic, content is displayed on a real time basis. So, when the user wants to display the content, JavaScript checks the server for the contents being asked.[5]
- This is done by either checking the URL or responding to the user directly. Now, request is sent to the server for the concerned data with the help of JavaScript.[5]
- A PHP script is run for checking the data in the server. This script is passed through SQL and a command is created in SQL with the information from JavaScript and PHP.[5]
- This SQL command is used to get data from the database as database will not understand direct coding or any scripts. Now, the data being fetched by SQL is fed into the PHP script.[5]
- The conversion of data being received is done so that JavaScript understands the output. This conversion is being done with the help of PHP script. JavaScript does not read SQL data and here Java Script Object Notation comes as a savior. JSON is being understood by JavaScript and PHP Script.[5]
- After receiving the JSON data from PHP, data is displayed on the website for the user. Here PHP acts as a bridge between SQL and JavaScript. The data being

displayed on the screen can be manipulated with the help of HTML and CSS. This makes the data more presentable and dynamic for the user.[5]

- Also, when the user wishes to change the content or delete the content, same process is followed and all the details are saved into the database.

5.2 Requirement Analysis

5.2.1 Rich Picture

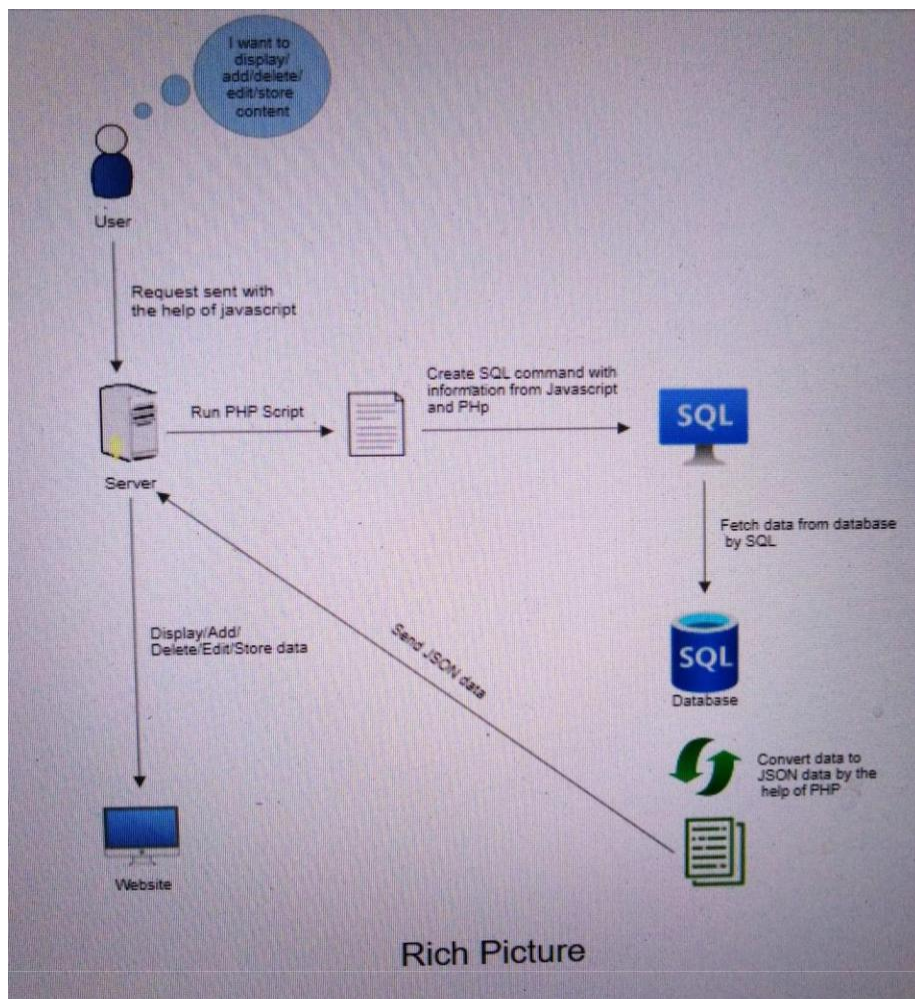


Fig 5.2.1: Rich Picture

5.2.2 Functional and Non-Functional Requirements

Functional Requirements: These are the requirements that the end user specifically demands as basic facilities that the system should offer. All these functionalities need to be necessarily incorporated into the system. They are basically the requirements stated by the user which one can see directly in the final product, unlike the non-functional requirements.

The functional requirements of this project are as follows:

- User can add page content
- User can delete page content
- User can edit page content
- User can view page content
- User can store page content
- User can search content

Non-Functional Requirements: Non-functional requirements are quality attributes that describe how the system should be. Equally as vital as functional requirements, failure to identify, design for, and meet the non-functional requirements that satisfy end-user needs can result in projects that fail or fall short.

The non-functional requirements of this project are as follows:

- **Usability** - The website is easy to use as user can easily navigate its interface and can quickly perform the tasks using phpMyAdmin Graphical User Interface (GUI).
- **Maintainability** - The system can be easily understood, changed, and tested. It is easy to correct a defect or modify the system.

- **Performance** - The user doesn't need to wait for a long time for a specific operation to happen. The system quickly responds to the user's actions.
- **Reliability** - The system will satisfactorily perform the tasks for which it was designed or intended in the specified environment.

5.3 System Analysis

5.3.1 Six Element Analysis

Table 5.3.1: Table for Six Element Analysis

Processes	System Roles					
	Human	Non-Computing Hardware	Computing Hardware	Software	Database	Network & Communication
Home Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
About Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
Team Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
Project Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet

News Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
Contact Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
Search Page	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page1	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page2	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page3	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page4	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page5	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet

News Page6	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page7	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet
News Page8	Client	None	Computer/ Smart phone	Google Chrome, Firefox, Visual Studio Code	MySQL	Internet

5.3.2 Feasibility Analysis

Table 5.3.2: Table for Feasibility Analysis

Operational Feasibility	The system satisfies the requirements identified in the requirements analysis phase of system development. The system is easy to use.
Cultural Feasibility	The system would be well accepted by all people who need it.
Technical Feasibility	The website uses HTML, CSS, Bootstrap, JavaScript, PHP and Mysql database. These are easily adaptive and popular with strong community support.
Economic Feasibility	The website meets user goals and requirements and is easy to use if one

	has sufficient technical knowledge. So it is a usable site and hence would lead to reduced development cost, decreased maintenance and support costs.
--	---

5.3.3 Problem Solution Analysis

The following steps have been followed for problem solution analysis :

1. **Identify the Problem** - Clearly articulate what the problem is. Not taking the time to fully analyze a problem can result in the development of solutions that are not fit for purpose or do not address the underlying issue.
2. **Look for Causes** - Find out what sequence of events lead to the problem? What conditions allowed the problem to occur? What is the impact of the problem?
3. **Develop Solutions** - List all the possible solutions. Later eliminate less desirable or unreasonable solutions and evaluate the remaining solutions in terms of their advantages and disadvantages.
4. **Implement the Solution** - Implement the suitable solution and evaluate how effective the solution was. Decide whether the existing solutions need to be revised, or whether a new solution is needed to better address the problem.

5.3.4 Effect and Constraints Analysis

The following constraints of the system have been identified :

- **Internet reliance** - The system is limited to the internet population. The site requires access to the internet.
- **Browser Support** - Unfortunately, everyone doesn't use the same browser. The site may not be supported across a variety of browsers.
- **Increased competition** - Whatever we do online, exposes us to more competitors as people get to know more about our ideas and steal those.

5.4 System Design

5.4.1 UML Diagrams

Use case Diagram :

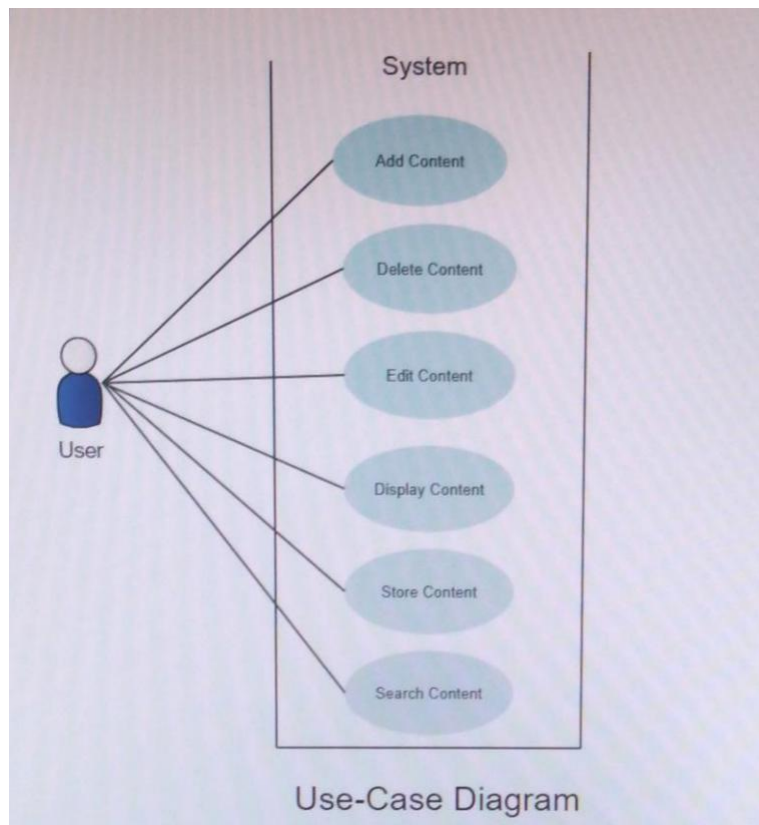


Fig 5.4.1.1: Use-Case Diagram

Activity Diagram :

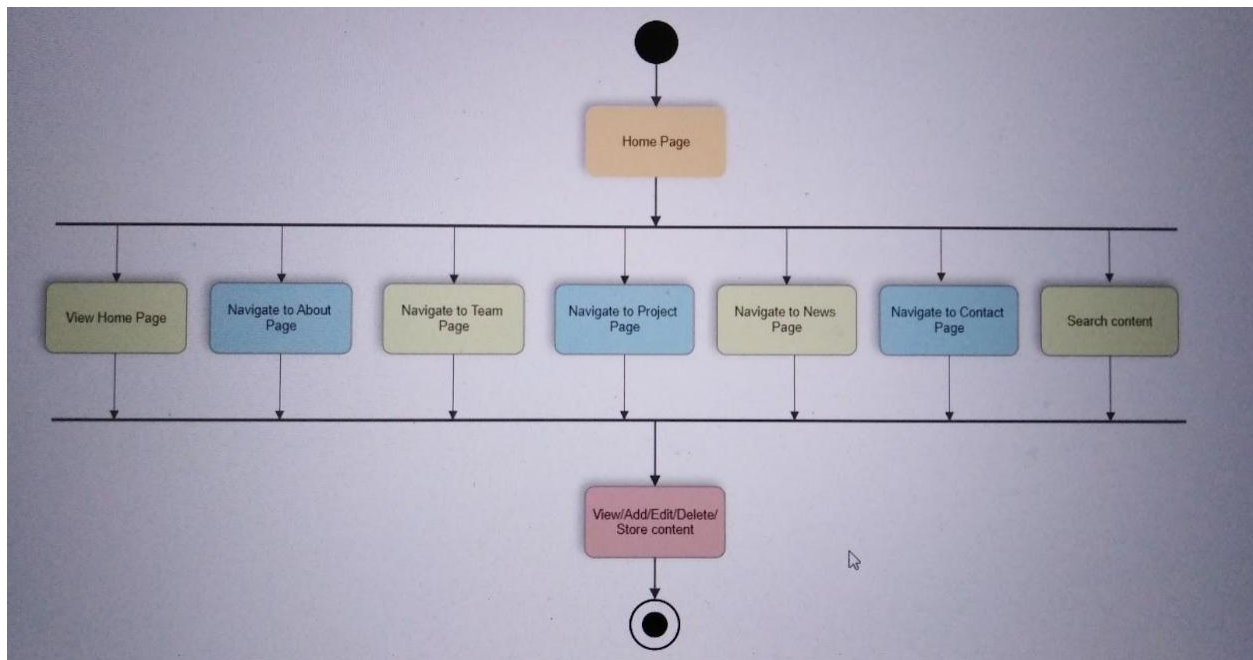


Fig 5.4.1.2: Activity Diagram

Entity Relationship Diagram :

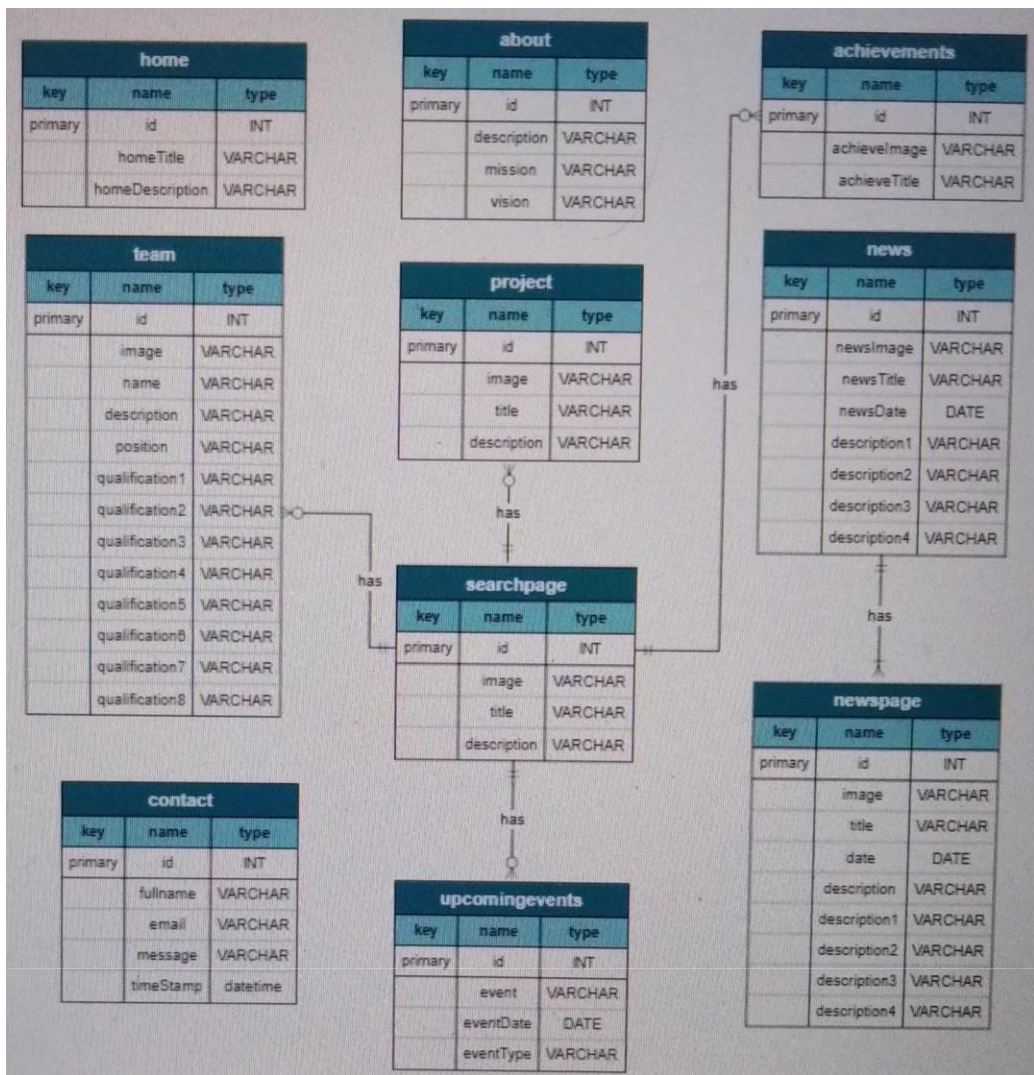


Fig 5.4.1.3: Entity Relationship Diagram

5.4.2 Architecture

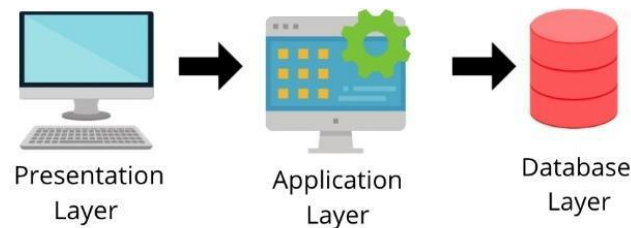


Fig 5.4.2: 3-tier Architecture

Three-tier architecture has been used for the web app. Three-tier architecture typically comprises a presentation tier, a business or data access tier, and a data tier. Three layers in the three tier architecture are as follows:

1. **Client layer** - It is also called the Presentation layer which contains the UI part of the application. This layer is used for the design purpose where data is presented to the user or input is taken from the user. Web presentation tiers are usually developed using HTML, CSS and JavaScript.[8]
2. **Business layer** - This layer, also known as application layer, acts as an interface between Client layer and Data Access Layer. In this layer, information collected in the presentation layer is processed - sometimes against other information in the data layer - using business logic, a specific set of business rules. This layer can also add, delete or modify data in the data layer. The business layer is typically developed using Python, Java, Perl, PHP or Ruby.[8]
3. **Data layer** - This is where the information processed by the application is stored and managed. This can be a relational database management system such as PostgreSQL, MySQL, MariaDB, Oracle, DB2, Informix or Microsoft SQL Server, or in a NoSQL Database server such as Cassandra,

CouchDB or MongoDB. Data Layer contains methods to connect with database and to perform insert, update, delete, get data from database based on our input data.[8]

In a three-tier application, all communication goes through the application tier. The presentation tier and the data tier cannot communicate directly with one another.

5.5 Implementation

The Development environment and tool on which the application is implemented is as follows:

Table 5.5: Table for Implementation

	Elements	
Hardware	CPU	11th Generation Intel® Core™ i5 Processor
	RAM	8GB
Software	Operating System	Windows 10
	Database Server	MySQL
	Browser	Chrome

5.6 Testing

5.6.1 Input

The following are the inputs for the system :

Table 5.6.1: Table for Inputs

WebPage	Input
Home Page	Home Page Contents
About Page	About Page Contents
Team Page	Team Page Contents
Project Page	Project Page Contents
News Page	News Page Contents
Contact Page	Contact Page Contents
Search Page	Search Page Contents
News Page1	News Page1 Contents
News Page2	News Page2 Contents
News Page3	News Page3 Contents
News Page4	News Page4 Contents
News Page5	News Page5 Contents
News Page6	News Page6 Contents
News Page7	News Page7 Contents
News Page8	News Page8 Contents

5.6.2 Output

The following are the outputs for the system :

Table 5.6.2: Table for Outputs

WebPage	Output
Home Page	Display Home Page
About Page	Display About Page
Team Page	Display Team Page
Project Page	Display Project Page
News Page	Display News Page
Contact Page	Display Contact Page
Search Page	Display Search Page
News Page1	Display News Page1
News Page2	Display News Page2
News Page3	Display News Page3
News Page4	Display News Page4
News Page5	Display News Page5
News Page6	Display News Page6
News Page7	Display News Page7
News Page8	Display News Page8

Chapter 6

Results & Analysis

6.1 Problem Statement

Researchers have a monopoly on knowledge and its possession. They disengage themselves from communicating with the public about their work, which is not right. Sharing your knowledge with the world directly brings attention and respect for your work, which clearly has career advancement benefits. Outreach to the public and wider community can lead to unexpected new connections and new ideas that could stimulate one's research. A website is the best way to do this long-term. More than that, it can open up to things like more media attention, collaborators, and potential industry partners.

6.2 Test log

Test log, a type of test artifact, is created during test execution and provides detailed information regarding the success of each test performed to validate the quality, performance, & functionality of the software.

Table 6.2: Table for Test log

Test ID	Test Case	Description	Pre-condition	Test Steps	Test Data	Expected Result	Actual Result	Test Status
T1	Add content	Add data to webpages	Need to create database and table	1. Go to phpMyAdmin 2. On the home	Webpage contents	Data is seen to be successfully added to intended webpages	As expected	Pass

				<p>page, click on the database name on the left sidebar that needs to be used.</p> <p>3. Click</p> <p>on the table name, in which the data has to be inserted.</p> <p>4. On the</p> <p>menu bar, click on the Insert button.</p> <p>5. Under</p> <p>Value, enter the corresponding data for each table column.</p> <p>6. Then</p> <p>click on Go button.</p>				
T2	Delete content	Delete data from webpages	Data should be present in the database	<p>1. Go to phpMyAdmin</p> <p>2. On the home page, click on the database name on the left</p>	Webpage contents	Desired data is seen to be successfully removed from intended webpages	As expected	Pass

				<p>sidebar that needs to be used. 3. Click</p> <p>on the table name, from which the data has to be removed. 4. To</p> <p>remove all content from a webpage, click on Check all checkbox and then click Delete. 5. To</p> <p>remove some content from a webpage, click on the corresponding row's Delete icon to remove that particular row's content.</p>				
T3	Edit content	Edit webpage data	Data should be present in the database	<p>1. Go to phpMyAdmin</p> <p>2. On the home page,</p>	Webpage contents	Data is seen to be successfully edited	As expected	Pass

				<p>select the database and table for which to edit data.</p> <p>3. To edit all content from a webpage, click on Check all checkbox and then click Edit.</p> <p>4. To edit some content from a webpage, click on the corresponding row's Edit icon to edit that particular row's content.</p>				
T4	Display content	Display database data in the webpage	Data should be inserted in database	<p>1.Insert data to database following steps of T1.</p> <p>2.Refresh webpage</p>	Webpage contents	Data is seen to be successfully displayed in webpage	As expected	Pass
T5	Store content	Store contact form data in database	Need to create database and table	<p>1.Navigate to contact page</p> <p>2.Enter Name, Email and Message</p>	Webpage contents	Data successfully stored in database	As expected	Pass

				3. Click on Submit button				
T6	Search content	Search for related webpage data	Need to have a search bar	1. Navigate to search bar 2. Enter search keywords 3. Click on search icon	Webpage contents	Search results displayed successfully in web page	As expected	Pass

6.3 Graphical User Interface Results

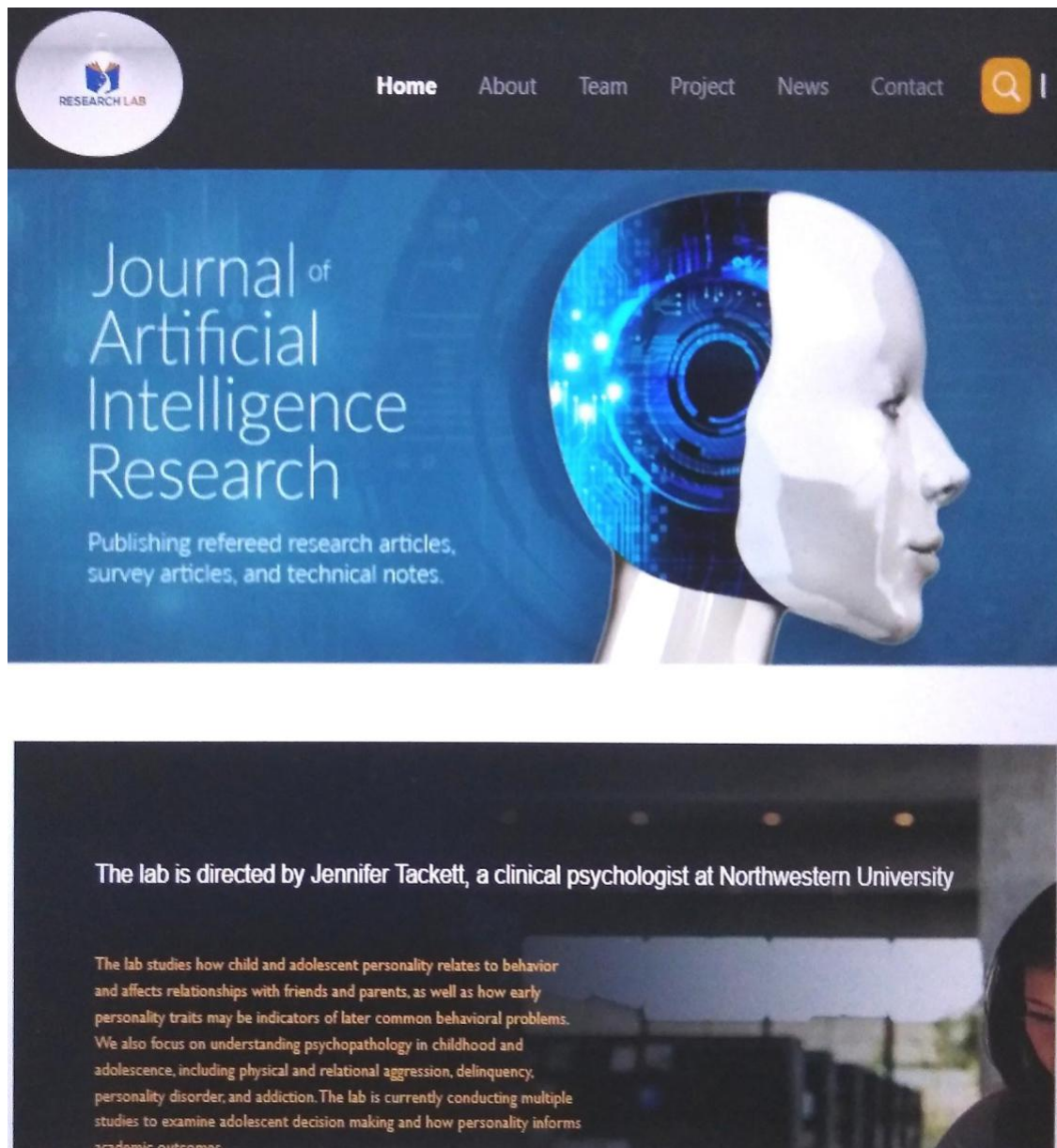
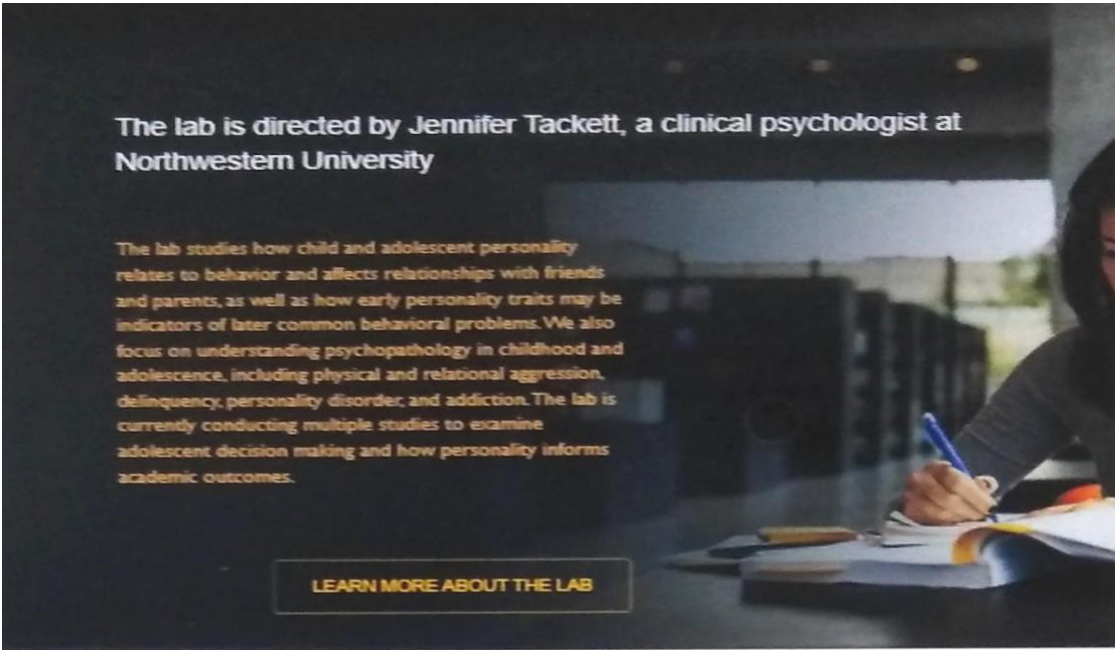


Fig 7.2.1: Home Page



The lab is directed by Jennifer Tackett, a clinical psychologist at Northwestern University

The lab studies how child and adolescent personality relates to behavior and affects relationships with friends and parents, as well as how early personality traits may be indicators of later common behavioral problems. We also focus on understanding psychopathology in childhood and adolescence, including physical and relational aggression, delinquency, personality disorder, and addiction. The lab is currently conducting multiple studies to examine adolescent decision making and how personality informs academic outcomes.

[LEARN MORE ABOUT THE LAB](#)

Upcoming Events

2022-07-04 Webfest 2022 Event	2022-07-05 Theoretical Concepts in Particle Physics Event	2022-07-08 Particle Zoo 2.0: New tetra and pentaquarks at LHCb Webcast
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Key Achievements

Fig 7.2.2: Home Page

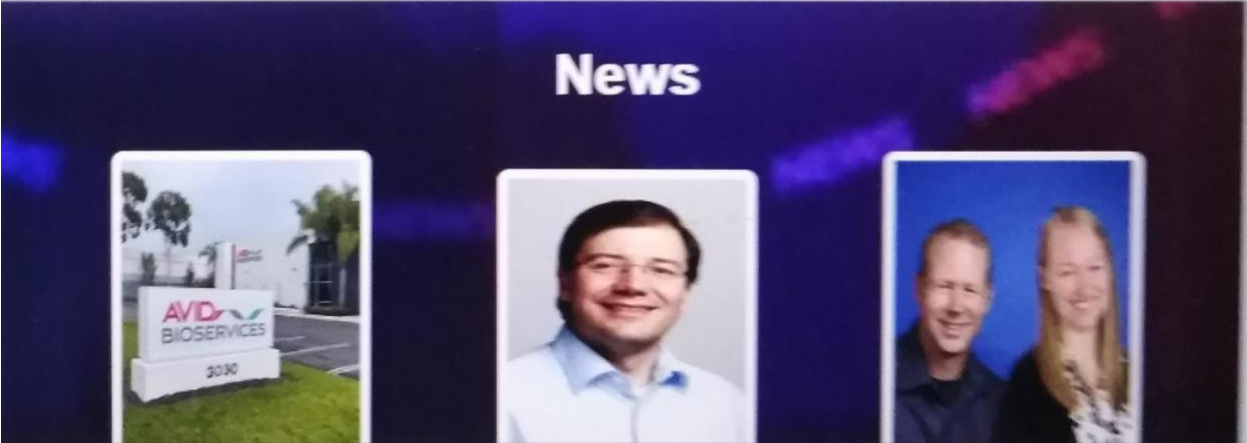


Fig 7.2.3: Home Page

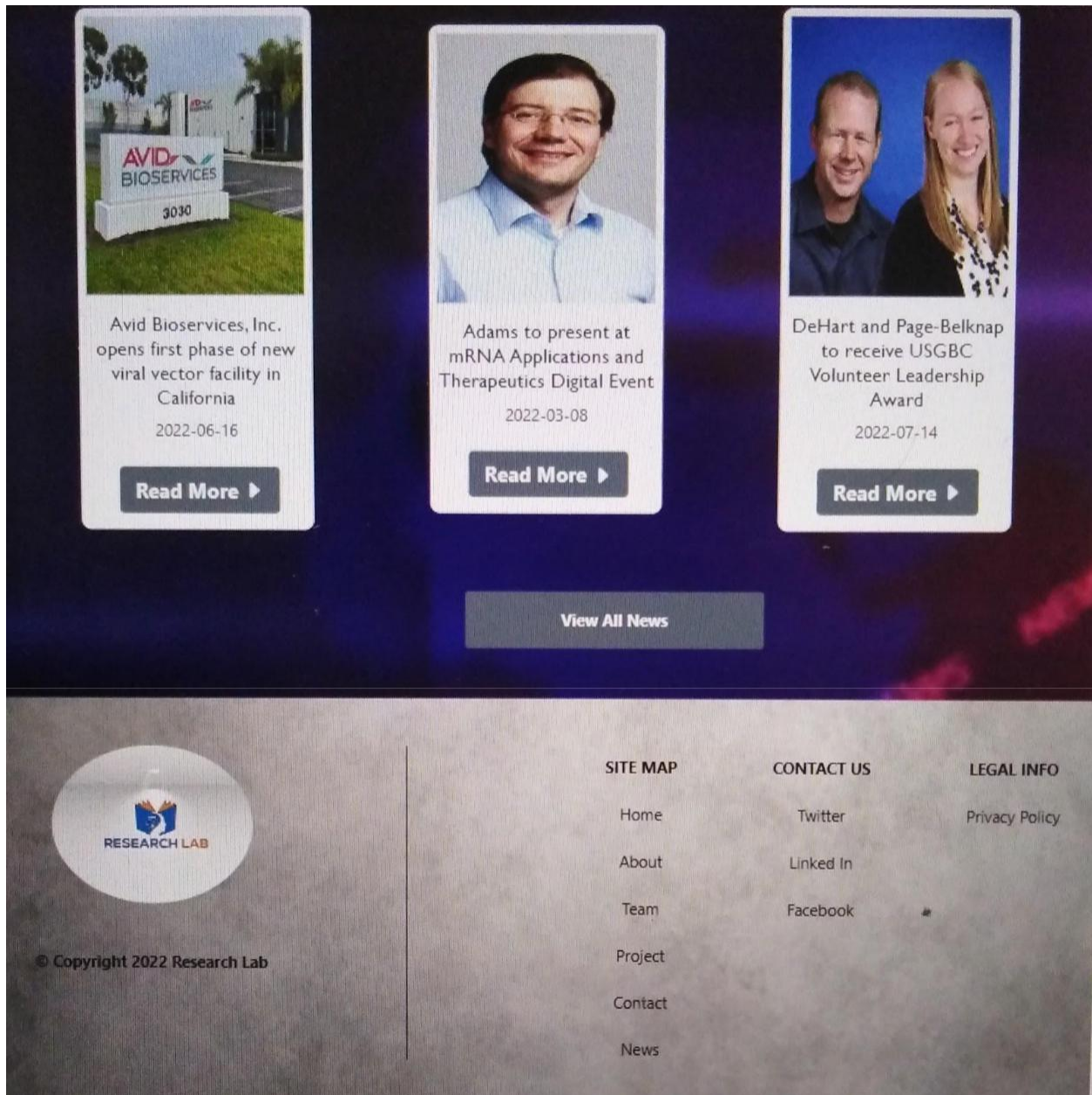


Fig 7.2.4: Home Page

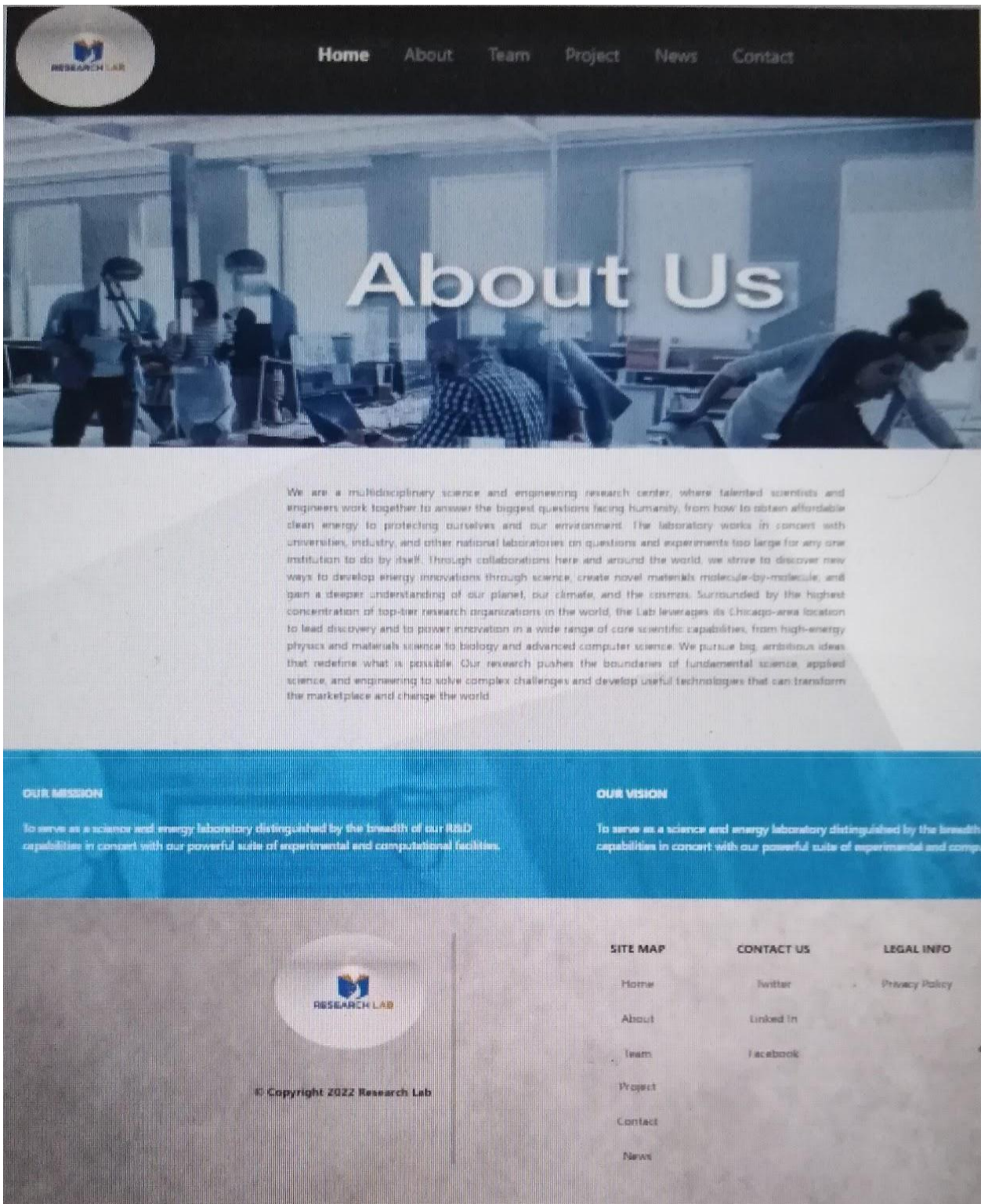




Fig 7.2.5: About Page



[Home](#) [About](#) [Team](#) [Project](#) [News](#) [Contact](#)

MEET THE TEAM



PhD, Neuroscience
 Albert Einstein College of
 Medicine 2019


MS, Neuroscience
 Albert Einstein College of
 Medicine 2019

MS, Applied Microbiology
 University of Notre Dame
 2012

BS, Biological Sciences
 University of Notre Dame
 2009

Nachiket Kamatkar
Postdoctoral Fellow

Nachi received his BS and MS from the University of Notre Dame. His master's thesis was on swarming motility of *Pseudomonas aeruginosa* in the laboratory of Joshua Shroet. For his PhD, Nachi moved to Albert Einstein College of Medicine, where he studied FGF signaling in the central nervous system in the laboratory of Jean Hebert and developed RNA aptamers specific for FGFR3. In collaboration with Dr. Matthew Levy, in the Nectow lab, Nachi is interested in studying circuit dynamics of the dorsal raphe nucleus and its role in circadian rhythm and hunger. He is also interested in developing novel viral and chemogenetic strategies to identify and dissect neural circuits required for energy homeostasis. Nachi was recently awarded a position on an NIH T32 Postdoctoral Training Grant for metabolism research. In his free time, Nachi enjoys exploring NYC, playing chess, and visiting breweries.



Srikanth Chowdhury
Postdoctoral Fellow

Srikanth received his BS and MS from the University of Chittagong in Bangladesh.

Fig 7.2.6: Team Page

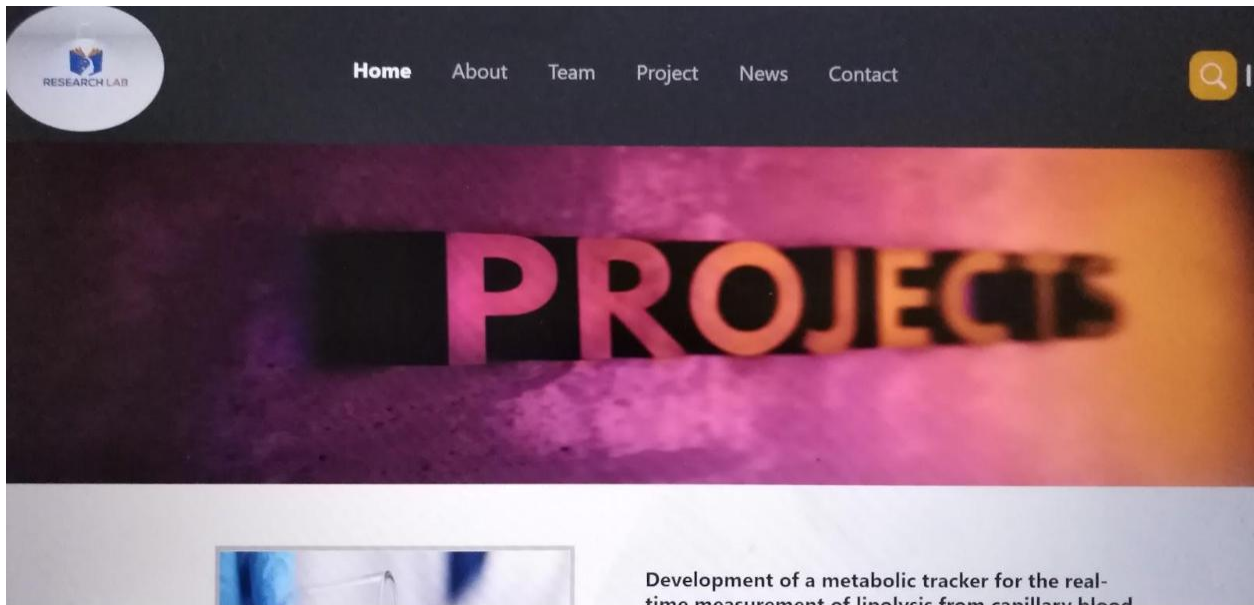


Fig 7.2.7: Project Page



Fig 7.2.8: Project Page

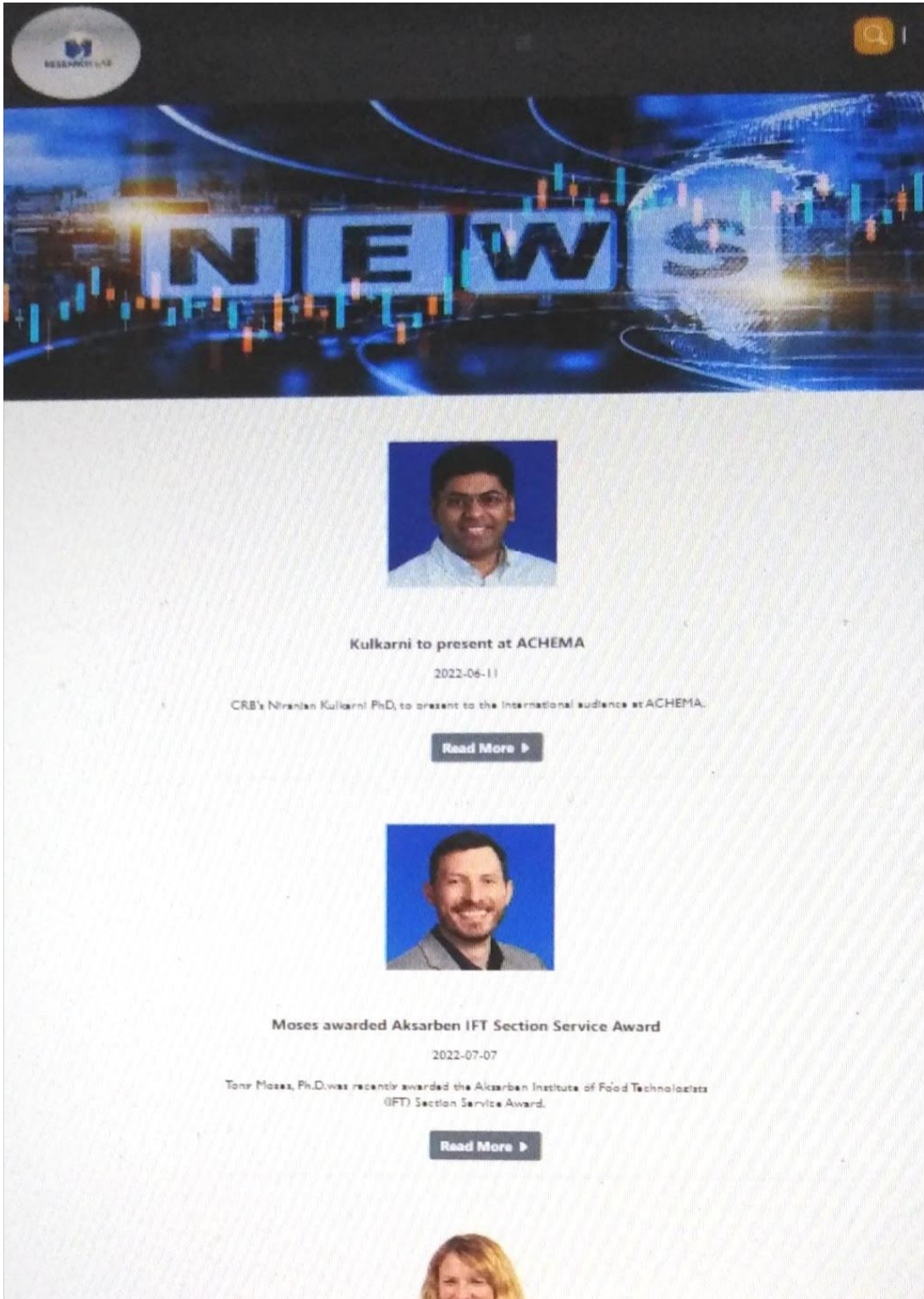


Fig 7.2.9: News Page

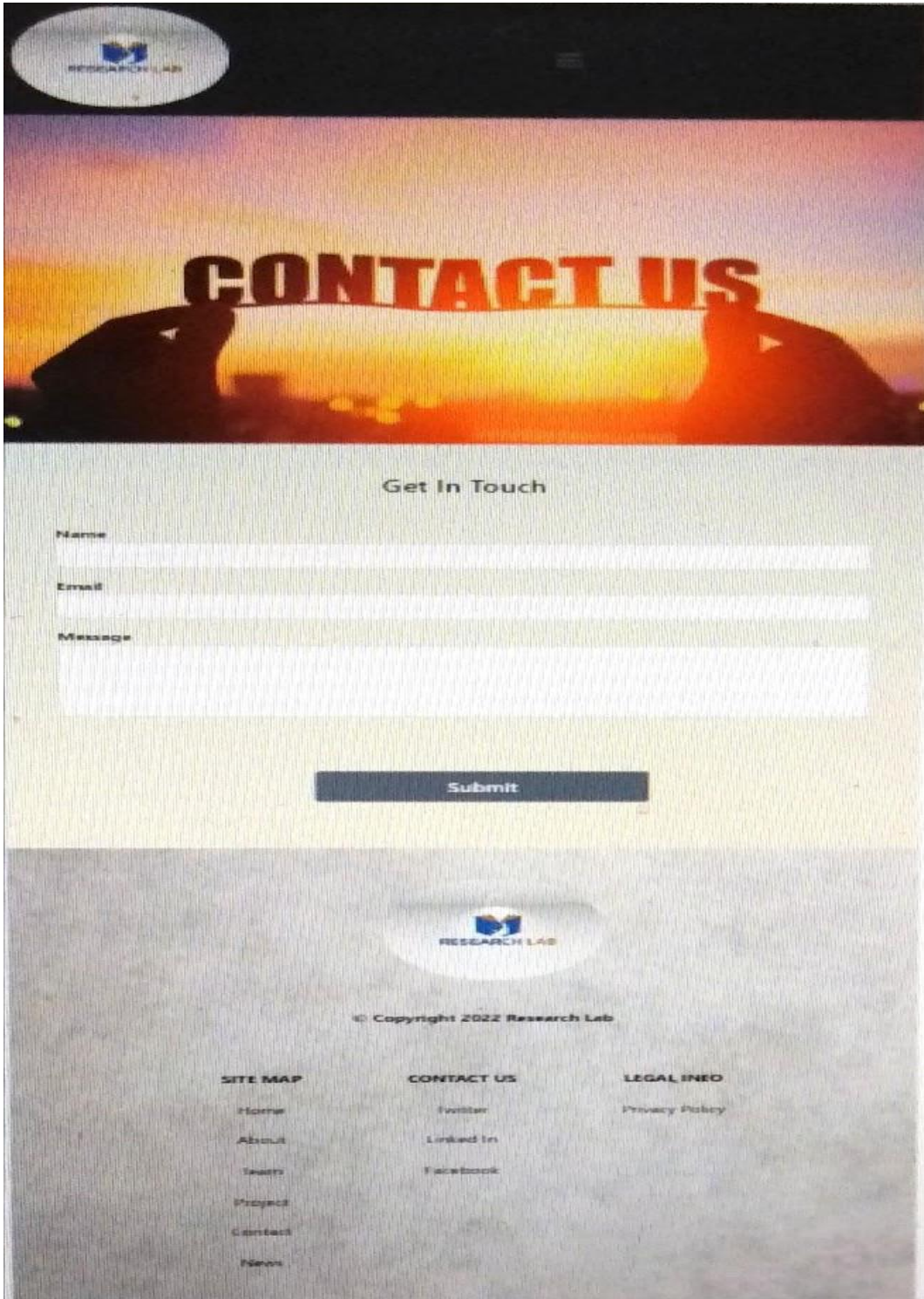


Fig 7.2.10: Contact Page

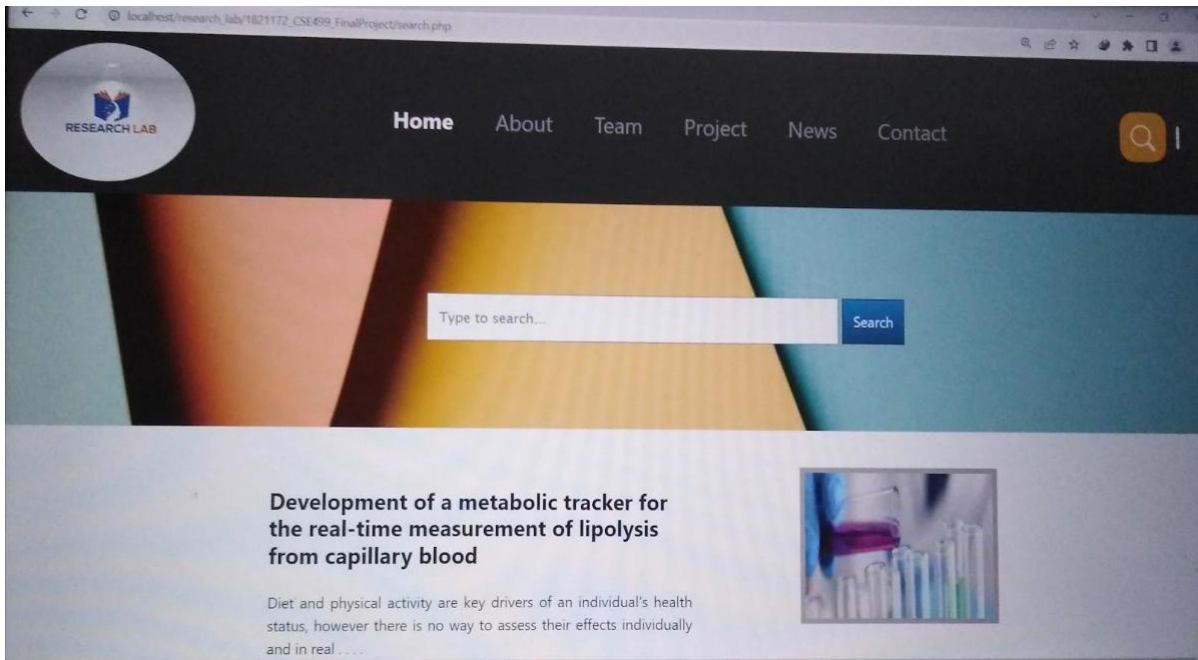


Fig 7.2.11: Search Page

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

The various processes and mechanisms that can be utilized for ensuring sustainability of the project are:

- Involving key stakeholders: A major step to ensure sustainability is the involvement and participation of key stakeholders in the development process.[11]
- Adaptability: A sustainable project should be open and able to fit in any changing environment or part of a system.[12]
- Communication and Outreach: Having a strong communication strategy can help in showcasing project results to a large audience. Well documented project results can help in getting support from a range of stakeholders.[11]
- Long term vision: We should know where we see our project after a period of 5 or 10 years. If we have thoroughly thought of how and what we will do in the long run, half of our work is done. Once we know the long term vision, we can easily draft the various things required to achieve it. [11]

Other factors such as financial analysis, risk analysis, communication and network determination, operational plan, training, human resource development and capacity building, environmental and community analysis all help to determine the sustainability of a project.

7.2 Social and Environmental Effects and Analysis

Social Effects Analysis:

Social influence has made the web gain immense popularity as a medium of social interactions. The Research Lab web platform will provide effective communication for individuals creating, sharing contents, knowledge, discussing information, ideas among the general public.

Environmental Effects Analysis:

Every website has an impact on the environment. In order to access a web page and display it in a browser, data must be carried and processed, therefore energy and CPU (Central Processing Unit) power are consumed; it is necessary to use a computer, servers and a network, whose production and use contribute to resource depletion and greenhouse gas (GHG) emissions.

However, not all websites have the same footprint; web pages do not all produce the same amount of CO₂, as some are heavier and more complex.[13] After publishing and sharing my site(project), one of the analyzing tools will be used to find out the environmental performance of the site.

7.3 Addressing Ethics and Ethical Issues

The following ethics and ethical issues were kept in mind while developing the website:

- The website would most likely work everywhere and for anyone who uses it.[14]
- There is no hiding of information on the website as important informations are easily accessible from the home page.
- The website would not cause any harm to society.
- The website supports healthy community and debate.

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

As I am new to everything, during the internship, I faced many challenges:

1. Competition from Co-Interns- Since I am not the only intern in my workplace, I experienced a competitive environment. It's not that my co-interns are competitive and trying to outdo me but they're just being hardworking and high-spirited.
2. Hesitant to Ask Questions- I landed a really good internship but upon starting realized that the work environment is excessively grave and professional. In such an environment, I found it difficult to ask questions for the fear of being judged.
3. Adapting to a New Work Lifestyle- Learning to adapt to a new lifestyle is a bit hard. I get to do away with some habits as well as adopting and forming new ones.

8.2 Solution of those problems

1. Competition from Co-Interns- At this stage of my career, the most important quality I can have is to be open-minded, drama-free, and easy to work with. People would then want to work with me because I'm enjoyable to work with and have a good attitude. Also, participating in the competition and working towards doing great work every day would enrich my internship experience.
2. Hesitant to Ask Questions- The solution of this would be to be confident enough to ask questions if not sure about something. It is always better to ask questions than making a mistake.

3. Adapting to a New Work Lifestyle- Changes are unexpected, so adaptation to change is essential for the survival of any organization. For that, it is necessary to incorporate some habits that allow it to be integrated into the company and professional life.

Chapter 9

Future Work & Conclusion

9.1 Future Works

So far, only the client's requirements have been implemented in the project. In the future, if the client needs more features to be added, those will be implemented as well.

9.2 Conclusion

The time I spent as an intern in The Recreation IT from June 6 2022 to September 6 2022 was a great experience for me as it helped me discover my potential. I believe that it will shape and influence my professional life while fostering personal growth and development. Not only did I gain practical skills but also I had the opportunity to meet many fantastic people. I was fortunate enough to have helpful and friendly colleagues and mentors who would take the time and effort to guide me. I think that the best part of my internship is the culture of my workplace - people work hard, but don't forget to enjoy themselves during the process, and they play hard as well. Throughout my internship I could understand more about the definition of a web developer and prepare myself to become a responsible and innovative web developer in future. I am really glad to be given this opportunity as it gave me the chance to develop myself through the various challenges presented to me.

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An Undergraduate Internship/Project on Web Application

Development of "Research Lab"

By

Sabrina Yasmin

Student ID: 1821172

Summer, 2022

Consent Form

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

(Signature of the Supervisor)

Sanzar Adnan Alam

Department of Computer Science & Engineering

Independent University, Bangladesh