

Human Resource Management System

by

Iftakhar Rasul Shams

ID: 18301175

An internship report submitted to the Department of Computer Science and Engineering in partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering.

Department of Computer Science and Engineering

Brac University

September 2023

© 2023. Brac University

All rights reserved.

Declaration

It is hereby declared that

1. The thesis submitted is my own original work while completing my degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material that has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. We have acknowledged all main sources of help.

Student's Full Name & Signature:

A handwritten signature in black ink, appearing to read 'Shams', with a long horizontal stroke extending to the right.

Iftakhar Rasul Shams
ID: 18301175

Approval

The thesis titled “Human Resource Management System” submitted by

1. Iftakhar Rasul Shams(ID: 18301175)

Of Summer, 2023 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of B.Sc. in Computer Science and Engineering on September 17, 2023.

Examining Committee:

Primary Supervisor:
(Member)



Maruf Hasan
Chief Technology Officer
Masterkey Technologies Ltd.

Secondary Supervisor:
(Member)



Saiful Islam
Senior Lecturer
Department of Computer Science and Engineering
Brac University

Head of Department:
(Chair)

Sadia Hamid Kazi, PhD
Chairperson and Associate Professor
Department of Computer Science and Engineering
Brac University

Ethics Statement

I, therefore, declare that the basis for my internship thesis is the outcome that I contributed through my efforts. All other materials utilized in the book have been properly acknowledged. This internship thesis has not been previously submitted in its entirety or in part to any other university or institute for the purpose of conferring a degree.

Abstract

Internships offer students valuable opportunities for experiential learning outside of the conventional academic setting, enabling learners to cultivate competencies, knowledge, and interpersonal aptitudes via hands-on projects in real-world contexts. The internship program offered by Masterkey Technologies Ltd. at Brac University is designed to offer students a practical understanding of professional work environments, enable the application of theoretical knowledge to real-world challenges, and equip them with the necessary skills for their forthcoming careers. Internships provide students with the opportunity to gain familiarity with a particular career trajectory, get pertinent professional experience, facilitate networking, and enhance their prospects of securing full- or part-time employment with the organization hosting the internship. The company provides marketing technology solutions that are powered by artificial intelligence. These solutions encompass several areas such as website and mobile app development, business management, digital marketing, e-commerce, affiliate marketing, and ad network solutions. Internships provide many key advantages for students. Firstly, they serve to acquaint individuals with a particular career trajectory, enabling them to get a comprehensive understanding of their chosen field. Secondly, internships give valuable opportunities for students to develop and enhance necessary skills, fostering personal and professional growth. Thirdly, internships facilitate the acquisition of practical work experience, which is crucial for future employment prospects. Additionally, internships enable students to establish professional connections within their industry, expanding their network of contacts. Lastly, internships significantly enhance the likelihood of securing employment with the host business, therefore improving students' chances of being employed. In brief, internships give students with valuable opportunities for experiential learning, fostering cognitive development and equipping them with the necessary skills and knowledge to navigate their forthcoming careers.

Keywords: Internship, Web Development, Software Library, JavaScript, Technology, Projects, Management System, HR, Software, Learn, Develop, Work Experience, Team, Growth, Challenges, User Interface, Frontend Development, Database, Application, Technical Skills, Soft Skills.

Dedication

Since their grin knows no bounds, I want to devote all of my efforts and hardships in my academic life to my wonderful parents. I also want to thank my reputable supervisor Maruf Hasan (CTO) for helping me develop into a competent professional by teaching me and supporting me throughout the internship period.

Acknowledgement

All glory and thanks be to the Most High God, without whom I never would have finished my thesis.

Next, I'd like to express my appreciation to my Chief Technology Officer and supervisor Maruf Hasan. The enhancements were all explained to me by him.

Finally, I would like to thank Saiful Islam sir for his unwavering support and direction during my internship.

In the end, I owe an amount of gratitude to my parents, without whom this may not have been conceivable. Their help and prayers have gotten me this close to the finish line, and I could not be more grateful.

Table of Contents

Declaration	i
Approval	ii
Ethics Statement	iii
Abstract	iv
Dedication	v
Acknowledgment	vi
Table of Contents	vii
List of Figures	ix
Nomenclature	x
1 Introduction	1
1.1 Preamble	1
1.2 Objective	1
1.3 Purpose of Internship	2
1.4 Document Overview	2
1.5 Limitation of The Report	2
2 Company Overview	3
2.1 Introduction	3
2.2 About Masterkey Technologies Ltd.	3
2.3 Services	3
2.4 Contact Details	4
3 Sources of Data Collection	5
3.1 Primary Sources	5
3.2 Secondary Sources	5
4 System Analysis	6
4.1 Frontend Development Tools	6
4.1.1 Libraries and Frameworks	6
4.2 Backend Development Tools	6
4.2.1 Programming Language	6

4.2.2	Frameworks	7
4.2.3	Database	7
4.3	Design Tools	7
4.4	Non-Functional Requirments	8
4.5	Use Case Diagram	8
5	System Architecture	9
5.1	RFID Implementation	9
5.2	User Interface Design	9
5.2.1	Login Page	9
5.2.2	Dashboard	10
5.2.3	Todo	11
5.2.4	Time and Attendance	12
5.2.5	End of Day	13
5.2.6	Leave	14
5.2.7	My Leave Status	15
5.3	MVC Pattern	16
5.4	Database Connection	17
6	Testing Strategies	18
6.1	Black-box Testing	18
6.2	White-box Testing	18
6.3	System Testing	18
6.4	Functional Testing	19
6.5	Alpha Testing	19
6.6	Beta Testing	19
7	Growth	20
7.1	Professional Growth	20
7.1.1	Team Work	20
7.1.2	Leadership Responsibilities	20
7.1.3	Time Management	21
7.2	Technical Growth	21
7.2.1	Git	21
7.2.2	Responsive and Mobile-First Design	21
7.2.3	Libraries and Extensions	21
7.3	Interpersonal Growth	22
7.3.1	Questioning	22
7.3.2	Logical Argument	22
7.3.3	Problem Solving	22
8	Conclusion	23
8.1	Conclusion	23
8.2	Recommendations	23
8.3	Future Enhancement	24
	Bibliography	25

List of Figures

2.1	Masterkey Technologies official Logo	4
4.1	Use case diagram	8
5.1	Login Page	9
5.2	Dashboard	10
5.3	Attendance tracker code	11
5.4	Todo	12
5.5	Todo code 1	12
5.6	Todo code 2	12
5.7	Todo code 3	12
5.8	Attendance time log	13
5.9	Attendance time log code	13
5.10	Employee end of the day	14
5.11	Eod code 1	14
5.12	Eod code 2	14
5.13	Eod code 3	14
5.14	Leave application	15
5.15	Leave code 1	15
5.16	Leave code 2	15
5.17	Leave code 3	15
5.18	Employee leave status	16
5.19	Leave status code 1	16
5.20	Leave status code 2	16
5.21	Leave status code 3	16
5.22	MVC pattern	17
5.23	Database connection	17

Nomenclature

The next list describes several symbols & abbreviation that will be later used within the body of the document

AMI Asynchronous Method Invocation

API Application Programming Interface

EOD End of Day

HR Human Resource

MKTech Masterkey Technologies

MVC Model View Controller

ODM Object Data Modelling

SPA Single Page Applications

UI User Interface

Chapter 1

Introduction

1.1 Preamble

In our university, we learn a lot of things, and internships provide students with the chance to gain practical learning experiences beyond the conventional educational environment. Through these experiences, students can develop their skills, build expertise through work in a professional setting, and develop interpersonal professional skills by working on real-world projects. It enables pupils to use their academic understanding in more difficult real-world scenarios.

I worked as an intern at Masterkey Technologies Ltd. under the supervision of Maruf Hassan and contributed my efforts to various projects. Then I reached out to the student's advisor of internships, Dr. Md. Golam Rabiul Alam sir, who attended the internship program, and he approved it after giving the company and project details. Brac University provides this internship opportunity for the following purposes.

- To give the student a taste of real-world working experience.
- To allow the student to apply their learning to real problems.
- To make the students more ready for their future professional life.

As a running student, an internship is a great experience as it improves the thinking ability of the students and shows the guideline to the professional world. I improved my soft and hard skills a lot after joining the internship program and I think students should take this opportunity provided by Brac University to improve them too.

1.2 Objective

The document is generated after working 6 months in Masterkey Technologies Ltd. based on my experience with the company and it's generated as a requirement of an internship program under the Computer Science and Engineering department of Brac University. So the general objective of this document is to complete the internship program. Apart from this, I generated this document to give an overview of Masterkey Technologies Ltd. and discuss their products, and working experience in the following company. This report will also represent my accomplishments, project work, and professional development during my internship. In addition, anyone searching for a quick summary of Masterkey Technologies Ltd. would find the information in this report beneficial.

1.3 Purpose of Internship

This article will outline the primary benefits of interning:

- In order to familiarise pupils with a certain career path and field of work.
- To offer students a chance to learn and grow relevant skills.
- Helping students acquire relevant job experience and bolster their resumes in preparation for successful future careers.
- To aid students in making professional connections, or networking.
- So that they have a fighting chance of getting hired full- or part-time by their host company.

1.4 Document Overview

I shared my work experience with Masterkey Technologies Ltd., and apart from this, I discussed my achievement and growth while working with the team. I discussed briefly the project I was assigned while completing the internship and some of the challenges in the project and how I overcame those problems. In a nutshell, this document will give a clear overview of Masterkey Technologies Ltd. and detailed information about my growth while doing this internship.

1.5 Limitation of The Report

I have run across roadblocks at every stage of data collection, analysis, and visualization. I have worked hard within my constraints to provide a report that I hope is both informative and engaging. Following is a discussion of the report's broad caveats.

- Organizational secrecy prevented me from including certain content in the report.
- The arrangement of certain materials obtained from additional resources exhibited inconsistencies.

Chapter 2

Company Overview

2.1 Introduction

Bangladesh is advancing quickly in the field of software and website development. Masterkey Technologies Ltd. is one of several notable software and website development companies in Bangladesh that have made a major contribution to the growth of the software and website development business sector. The largest and trickiest difficulties facing their clients may all be solved by this amazing team. The services provided by this company are delivered with pride and enthusiasm both onshore and offshore. This company is made up of a group of young, talented, and ambitious individuals whose main objective is to offer their clients cutting-edge software and web development solutions.

2.2 About Masterkey Technologies Ltd.

Masterkey Technologies Ltd. provides AI-powered marketing-tech solutions. 360-degree solutions to simplify one's business experience. Its solutions are purpose-driven, performance-oriented, and advised by respected industry experts. They stand out by launching the correct technology with proper communication integration.

2.3 Services

Every organization in the modern world largely relies on technology to maintain connectivity, generate money, and meet ever-increasing client needs. Information technology (IT), which includes a vast range of topics including computer software, information systems, programming languages, database management systems, networking, etc., is unquestionably the key to managing technology. Masterkey Technologies offers an incredible array of services and solutions while keeping this in mind. Masterkey Technologies provides the following services:

- Website and mobile app development.
- Business management solution.
- Digital marketing solution.

- E-commerce solution.
- Affiliate marketing solution.
- Ad network solution.

2.4 Contact Details

Organization: Masterkey Technologies Ltd.

Address: TA-39/1, Gulshan - Badda Link Road, Dhaka - 1212

Email: contact@masterkey.tech

Official Logo:



Figure 2.1: Masterkey Technologies official Logo

Chapter 3

Sources of Data Collection

I utilized data-collecting techniques here that explain the approach I used in my report in order to make it as flawless as possible. Information has been obtained for this study from the combined use of primary and secondary resources.

3.1 Primary Sources

Various in-person interviews with representatives from several Masterkey Technologies divisions have been undertaken to gather primary data. They contributed information that was crucial to our report. I interviewed the following experts:

- Acquired information by questioning several personnel.
- Access to several documents is possible through the Masterkey Technologies portal.
- Website of Masterkey Technologies used for content.
- Understanding the work of individual employees of Masterkey Technologies.
- Collecting information from the company's Handbook.

3.2 Secondary Sources

Data was acquired from the internet and numerous publications and sources are listed in the references section to help people comprehend diverse software application techniques, software quality assurance, and various topics. The report's secondary sources of data collection include the following:

- There are several websites that outline generally recognized norms.
- Numerous websites that chronicle the accomplishments of multinational corporations.
- Reference or most relevant Books.
- In order to create standards, I have analyzed several internship reports.

Chapter 4

System Analysis

4.1 Frontend Development Tools

4.1.1 Libraries and Frameworks

Tailwind CSS

Developers adore Tailwind, a utility-first CSS framework that makes it simple to build cutting-edge user experiences. A certain CSS attribute has been pre-defined for a sizable number of classes in Tailwind. For multiple resources, there are numerous utility classes. For instance, the text-center class for text-align: center; etc.

Bootstrap

A well-liked CSS framework called Bootstrap is employed to develop websites and on-line applications that are mobile-first and responsive. It offers pre-built JavaScript, CSS, and HTML design elements to aid developers in creating user interfaces (UI). 19% of internet websites utilize Bootstrap, according to W3Techs.

React.js

Single Page Applications (SPAs) are made with the help of Meta's React frontend JavaScript toolkit. It is without a doubt the most well-liked frontend framework that facilitates the development of sophisticated programs. It has additional capabilities like component-based design, Virtual DOM, and a sizable community for assistance, making it the greatest option for any developer to learn the technology.

4.2 Backend Development Tools

4.2.1 Programming Language

JavaScript

Due to its importance in web development, JavaScript requires no introduction. JavaScript is a key web development language along with HTML and CSS. The programming language is popular among web developers. It ranks high in many programming language indices. Besides web development, the programming language may be used to create games and mobile apps. This language has imperative

and structured programming paradigms, lightweight, object-oriented programming, platform independence, and more. JavaScript may be utilized for both frontend and backend development as well.

4.2.2 Frameworks

Express.js

The Express framework is a Node.js web application framework that is known for its lightweight nature and adaptability with many capabilities for online and mobile apps. Express provides basic web application functionality while keeping Node.js' beloved features.

4.2.3 Database

MongoDB

The database in question is a document-oriented database that is both free and open-source. MongoDB is widely favored by web developers. The NoSQL database employs JSON-like documents with alternative schemas for data storage and retrieval, hence offering significant advantages in terms of scalability and flexibility. MongoDB offers a range of functions, including ad-hoc queries, indexing, replication, load balancing, file storage, aggregation, transactions, and more. This database exhibits enhanced security measures and data recovery capabilities in comparison to other database management systems. In addition to the aforementioned, MongoDB provides support for programming languages such as C/C++, Java, PHP, Python, Ruby, and several more.

4.3 Design Tools

Lottifiles

Free animations from LottieFiles are the world's biggest collection, with hundreds of original designs for personal and business usage. The animations are professionally made and may be customized by color, height, width, animation speed, etc. to complement the website style. After finishing all inputs, copy and paste the resulting code into your project.

Google Fonts

Google Fonts offers hundreds of free font families for your project. Improves typography to enhance your website's visuals. The typefaces come in numerous weights, styles, and scripts, providing for many design options and easy integration.

Figma

Figma is a web-based design tool for mobile and web app user interface collaboration. Figma lets designers create high-fidelity designs and interactive prototypes using vector editing, prototyping, animation, and more. The software also has plugins for designers to interface with other design tools and improve its capabilities.

Neumorphism

Neumorphism is a common design principle used in modern user interfaces. Create one's own Neumorphism style with the help of Neumorphism.io, a fantastic generating tool. Visual adjustments to the design's scale, proximity, depth, and sharpness are all possible with this program. At long last, the produced CSS code is based on the inputs.

4.4 Non-Functional Requirments

The application's non-functional requirements are as follows.:

Usability: The application must be simple and functional for accurate suggestions.

Performance: The program will work with genuine user input.

Extensibility: The application utilizes MongoDB Server for suggestions. Future updates will add functionality.

4.5 Use Case Diagram

The use-case diagram serves as a graphical depiction of the interactions that occur among the many stakeholders of the system, including users, and administrators. In this project, the employees act as end users, while the administrator develops a system for managing the HRM system as a whole. The user performs a variety of tasks, all of which are overseen by the administrator.

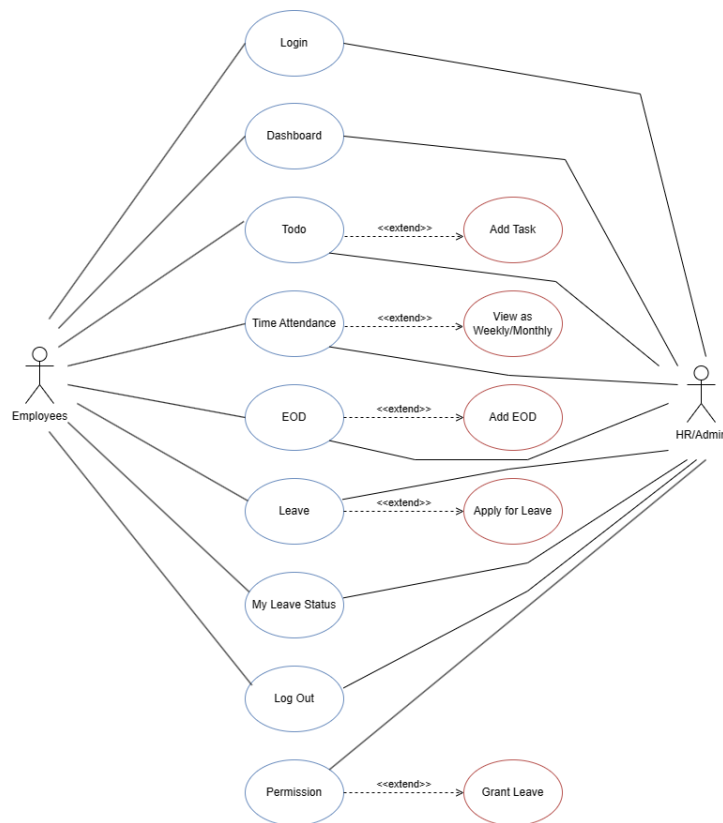


Figure 4.1: Use case diagram

Chapter 5

System Architecture

5.1 RFID Implementation

Employees' attendance is recorded before entering and leaving the workplace using RFID technology. Employees must register their presence on the RFID reader using an RFID tag. Attendance system data is accurate and efficient. Thus, each employee has an RFID card. RFID allows for fast and easy timing and attendance monitoring.

5.2 User Interface Design

Machine and software interfaces, including those of computers, mobile devices, and other electronic devices, are the subject of user interface design (UI), which aims to improve both the accessibility and the user experiences of these interfaces. In user-centered design, the objective is to simplify and streamline the user's engagement with the system so that the user may more easily achieve their objectives.

5.2.1 Login Page

The login page for employees is located here. Each employee has a unique email address from the MKTech domain. The HR department can be contacted to get the emails and passwords.

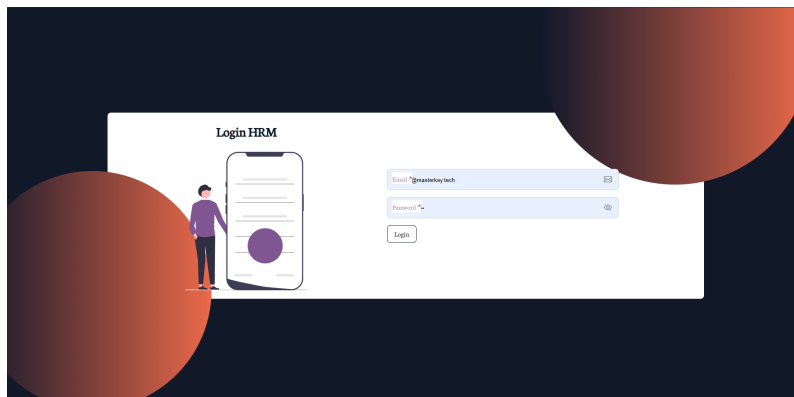


Figure 5.1: Login Page

5.2.2 Dashboard

By centralizing and presenting key metrics, dashboards may help improve corporate operations, efficiency, and productivity. With the use of real-time data, they can also aid in spotting and averting future issues. The main dashboard features are as follows.

Welcome Message

When a user logs in, this feature welcomes them. Depending on the login information for the employee, the name may change.

Attendance Tracker

This function displays the overall number of tardies for each employee. The attendance tracker may also be shown on a weekly or monthly basis.

Leaderboard

A leaderboard makes use of a work representative's innate need to compare their performance to that of others to increase motivation and guarantee that there is nowhere to go when it comes to achieving goals and expectations. Here, the leaderboard is calculated based on the performance and total work hours. As a result, it motivates all the employees to improve their performance.

Notice Board

The notice board feature displays significant news and business holidays. It aids in meticulous schedule preparation.

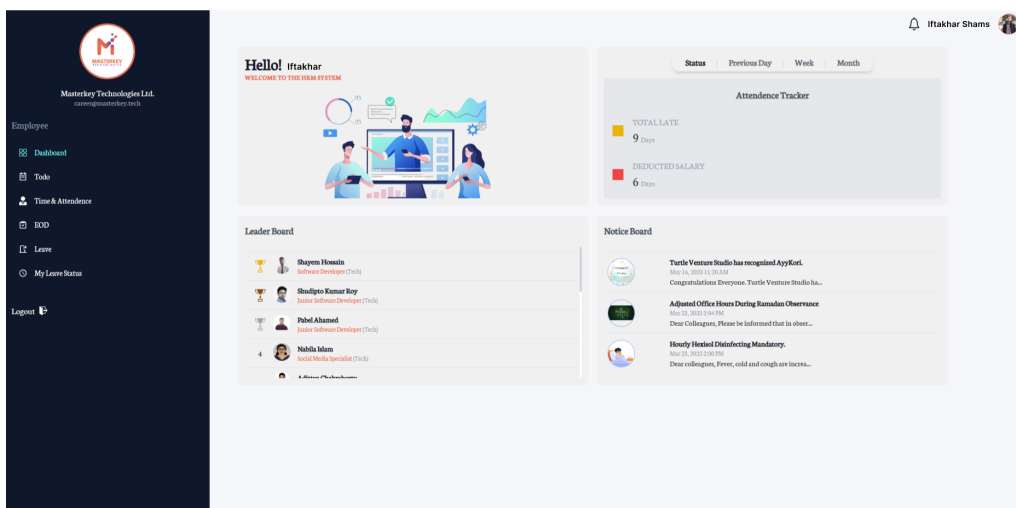


Figure 5.2: Dashboard

Code

In the following code, I have developed a const SalaryTracker variable as a representation of the attendance tracker. Additionally, SalaryTracker contains 3 other variables such as totalLate, deductSalary, and user to pass the data to the method.

```
1 import React from "react";
2
3 const SalaryTracker = ({ totalLate, deductSalary, user }) => {
4   return (
5     <div className="flex flex-col gap-y-6 bg-gray-200 p-4 rounded-md">
6       <h1 className="text-lg font-semibold text-gray-600 text-center">
7         Attendance Tracker
8       </h1>
9       <div className="flex items-center gap-x-4">
10        <div className="w-5 h-5 bg-yellow-500"></div>
11        <div className="flex flex-col">
12          <h1 className="text-gray-400 text-base uppercase">Total Late</h1>
13          <h1 className="text-gray-700 text-2xl">
14            {totalLate} <span className="text-sm text-gray-400">Days</span>
15          </h1>
16        </div>
17      </div>
18      <div className="flex items-center gap-x-4">
19        <div className="w-5 h-5 bg-red-500"></div>
20        <div className="flex flex-col">
21          <h1 className="text-gray-400 text-base uppercase">Deducted Salary</h1>
22          {user?.employeeStatus == "Intern" ? (
23            <h1 className="text-gray-700 text-2xl">
24              0 <span className="text-sm text-gray-400">Days</span>
25            </h1>
26          ) : (
27            <h1 className="text-gray-700 text-2xl">
28              {deductSalary} <span className="text-sm text-gray-400">Days</span>
29            </h1>
30          )}
31        </div>
32      </div>
33    </div>
34  );
35 };
36
37 export default SalaryTracker;
```

Figure 5.3: Attendance tracker code

5.2.3 Todo

Employees can add tasks to the HR management system using the to-do function. The employee has the ability to add, remove, and cross off completed assignments. Unfinished tasks will become red in color and can be done the next day. Employees' past 30 days' worth of tasks or forthcoming 30 days' worth of work may also be displayed in the to-do function.

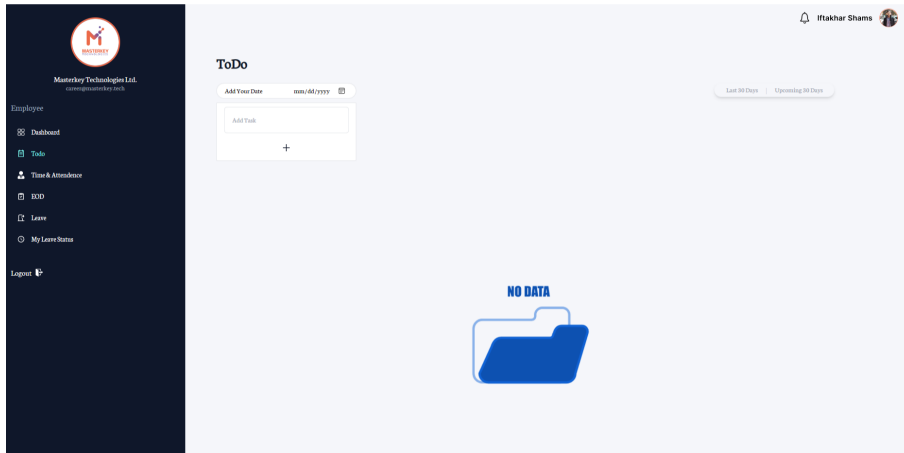


Figure 5.4: Todo

Code

In the code of Todo feature, I have created multiple variables and arrays to pass or return the data. In variable `const handleCheck`, I checked items from the list to add or remove. And return classes based on whether the item is checked or not. By creating the `const handleDelete` variable, I have added a function to delete a todo. Similarly, created `const handleUpdate` function so that employees can update their todo list.

```

import React, { useState } from 'react';
import './index.css';
import { useNavigate } from 'react-router-dom';
import { useAuth } from 'react-auth-kit';
import { useEmployee } from 'react-employee';
import { useTodo } from 'react-todo';
import { useTime } from 'react-time';
import { useAttendance } from 'react-attendance';
import { useEOD } from 'react-eod';
import { useLeave } from 'react-leave';
import { useMyLeaveStatus } from 'react-my-leave-status';

const App = () => {
  const navigate = useNavigate();
  const auth = useAuth();
  const employee = useEmployee();
  const todo = useTodo();
  const time = useTime();
  const attendance = useAttendance();
  const eod = useEOD();
  const leave = useLeave();
  const myLeaveStatus = useMyLeaveStatus();

  return (
    <div>
      <div>
        <img alt="Masterkey Technologies Ltd. logo" data-bbox="255 90 285 115"/>
        <p>Masterkey Technologies Ltd.</p>
        <p>companyname@masterkey.com</p>
      </div>
      <div>
        <ul>
          <li>Dashboard</li>
          <li>ToDo</li>
          <li>Time & Attendance</li>
          <li>EOD</li>
          <li>Leave</li>
          <li>My Leave Status</li>
        </ul>
      </div>
      <div>
        <h3>ToDo</h3>
        <p>Add Your Date: <input type="text" value="mm/dd/yyyy" /></p>
        <p>Add Task: <input type="text" value="" /> <span>+</span></p>
        <div style="text-align: center; margin-top: 20px;">
          <img alt="NO DATA folder icon" data-bbox="505 215 580 255"/>
          <p>NO DATA</p>
        </div>
      </div>
    </div>
  );
};

export default App;

```

Figure 5.5: Todo code 1

```

// ... (previous code) ...
const handleCheck = (id) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const { checked } = item;
  const newChecked = !checked;
  const newTodos = todos.map(todo =>
    todo.id === id ? { ...todo, checked: newChecked } : todo
  );
  setTodos(newTodos);
};

const handleDelete = (id) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const newTodos = todos.filter(todo => todo.id !== id);
  setTodos(newTodos);
};

const handleUpdate = (id, title) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const newTitle = title;
  const newTodos = todos.map(todo =>
    todo.id === id ? { ...todo, title: newTitle } : todo
  );
  setTodos(newTodos);
};

```

Figure 5.6: Todo code 2

```

// ... (previous code) ...
const handleAdd = (title, date) => {
  // ... (previous code) ...
  const newTodo = {
    id: Date.now(),
    title,
    date,
    checked: false
  };
  const newTodos = [...todos, newTodo];
  setTodos(newTodos);
};

const handleToggle = (id) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const { checked } = item;
  const newChecked = !checked;
  const newTodos = todos.map(todo =>
    todo.id === id ? { ...todo, checked: newChecked } : todo
  );
  setTodos(newTodos);
};

const handleRemove = (id) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const newTodos = todos.filter(todo => todo.id !== id);
  setTodos(newTodos);
};

const handleUpdateTitle = (id, title) => {
  // ... (previous code) ...
  const item = todos.find(todo => todo.id === id);
  if (!item) return;
  const newTitle = title;
  const newTodos = todos.map(todo =>
    todo.id === id ? { ...todo, title: newTitle } : todo
  );
  setTodos(newTodos);
};

```

Figure 5.7: Todo code 3

5.2.4 Time and Attendance

The RFID technology provides the foundation for the time and attendance function. If the employee punches the RFID card after the initial authorized time, the attendance will be deemed to be late. Additionally, the overtime function will begin counting after the remaining allotted time. The employee's daily entry time, leave time, on-time or late status, and overall lateness may all be seen in this attendance time log. The attendance time log is by default displayed weekly, however, it may also be displayed monthly.

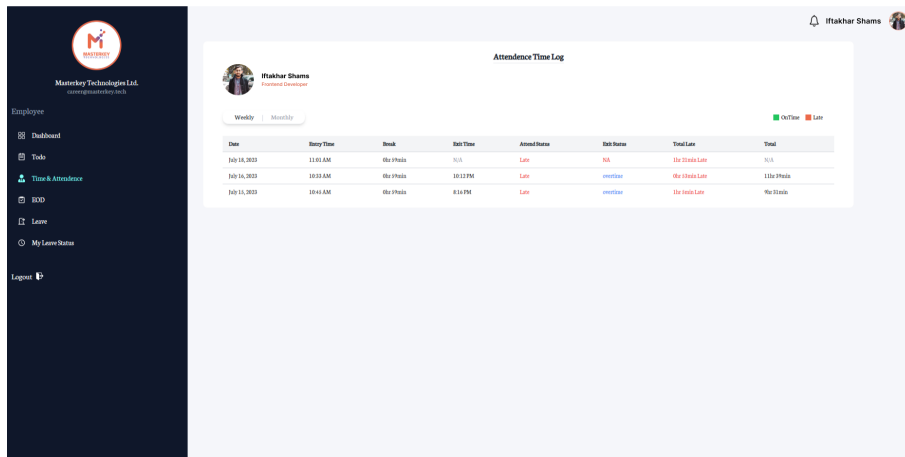


Figure 5.8: Attendance time log

Code

In the attendance time log, firstly I have called the essential packages such as moment, React, DatePicker, etc. Then I added functionality for date format using const dateFormat variable which shows as “DD MMM YYYY” on the website. Also, I have added a button for every click which returns the time and date format from the RFID reader. That is how the function reads data from the RFID reader and updates the time and date in the HR management system.

```

1 import moment from "moment";
2 import React from "react";
3 import DatePicker from "react-datepicker";
4 import "react-datepicker/dist/react-datepicker.css";
5 import { FaRegCalendarAlt } from "react-icons/fa";
6 const AttendDate = ({ date, setDate }) => {
7   const dateFormat = "DD MMM YYYY";
8
9   const CustomInput = ({ value, onClick }) => {
10    <button
11      onClick={onClick}
12      className="whitespace-pre w-full text-sm text-primaryColor px-2 py-1 border flex justify-center items-center gap-x-2 bg-white rounded-full border-primaryColor"
13    >
14      <FaRegCalendarAlt />
15      {value}
16    </button>
17  );
18
19   return (
20     <DatePicker
21       selected={date}
22       onChange={(date) => setDate(date)}
23       customInput={CustomInput value={date} />
24       value={moment(date).format(dateFormat)}
25     />
26   );
27 };
28
29 export default AttendDate;

```

Figure 5.9: Attendance time log code

5.2.5 End of Day

Employees can share their daily completed tasks with the HR management system using the EOD function. The prescribed duties are easier to remember. Additionally, it is useful to remember where a worker left off. It improves productivity since one may remember what they have done and where they should start the next day with only a quick peek at their eod. An employee has the option to add or remove the bullet points in this sentence. We, the developers at Masterkey Technologies, built this functionality in a way that allows users to access all shared Eod on a weekly or monthly basis.

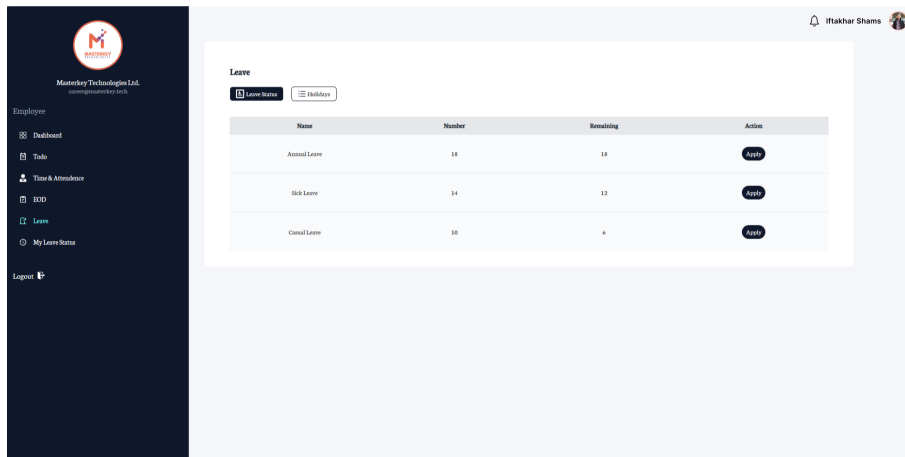


Figure 5.14: Leave application

Code

In the corresponding feature's code, after initializing all the essential packages, use-Effect method is used to get all users and all employees leaves. A method that returns data is created so that employee can apply for casual leave, annual leave, and sick leave. The method also updates the remaining leave for the employee after taking the aforementioned leaves.

```

import React, { useState, useEffect } from 'react';
import axios from 'axios';
import { useAuth } from 'react-auth-kit';
import { useNavigate } from 'react-router-dom';
import { toast } from 'react-toastify';

const Leave = () => {
  const [leaveType, setLeaveType] = useState('');
  const [start, setStart] = useState('');
  const [end, setEnd] = useState('');
  const [reason, setReason] = useState('');
  const [message, setMessage] = useState('');

  const user = useAuth().currentUser;
  const navigate = useNavigate();

  const applyLeave = async () => {
    try {
      const response = await axios.post('/api/leave/apply', {
        type: leaveType,
        start: start,
        end: end,
        reason: reason,
      });
      setMessage(response.data.message);
    } catch (error) {
      toast.error(error.response.data.message);
    }
  };

  return (
    <div>
      <h3>Apply Leave</h3>
      <input type="text" value={leaveType} onChange={e => setLeaveType(e.target.value)} />
      <input type="text" value={start} onChange={e => setStart(e.target.value)} />
      <input type="text" value={end} onChange={e => setEnd(e.target.value)} />
      <input type="text" value={reason} onChange={e => setReason(e.target.value)} />
      <button onClick={applyLeave}>Apply</button>
      <p>{message}</p>
    </div>
  );
};

```

```

const useLeave = () => {
  const [leaves, setLeaves] = useState([]);
  const [loading, setLoading] = useState(false);
  const [error, setError] = useState('');

  const fetchLeaves = async () => {
    setLoading(true);
    try {
      const response = await axios.get('/api/leave');
      setLeaves(response.data);
    } catch (error) {
      setError(error.response.data.message);
    }
    setLoading(false);
  };

  return {
    leaves,
    loading,
    error,
    fetchLeaves,
  };
};

```

```

const updateLeaveStatus = async (id, status) => {
  try {
    const response = await axios.put(`/api/leave/${id}/status`, {
      status: status,
    });
    return response.data;
  } catch (error) {
    return error.response.data;
  }
};

const useLeaveStatus = () => {
  const [status, setStatus] = useState('');
  const [message, setMessage] = useState('');

  const updateStatus = async () => {
    try {
      const data = await updateLeaveStatus(leaveId, status);
      setMessage(data.message);
    } catch (error) {
      toast.error(error.response.data.message);
    }
  };

  return {
    status,
    updateStatus,
    message,
  };
};

```

Figure 5.15: Leave code 1 Figure 5.16: Leave code 2 Figure 5.17: Leave code 3

5.2.7 My Leave Status

An overview of the leaves taken by the employees is provided via the “My Leave Status” function. In this feature, names, leave types, reasons for taking a leave, start and end dates for the leave, and the status of admin-managed approval are displayed to the workers. Thus, Employees collaborate with the HR management system accordingly.

Name	Leave Type	Reason	Start Date	End Date	No. of Days	Status
Hakkar Shams	Casual Leave	This casual leave was applied for the period of 1 day from 11/05/2023 to 12/05/2023.	May 11, 2023	May 11, 2023	1	Approved
Hakkar Shams	Casual Leave	This casual leave was applied for the period of 2 days from 13/05/2023 to 14/05/2023.	May 13, 2023	May 14, 2023	2	Approved
Hakkar Shams	Sick Leave	This sick leave was applied for the period of 2 days from 15/05/2023 to 16/05/2023.	May 15, 2023	May 16, 2023	2	Approved

Figure 5.18: Employee leave status

Code

In the following code, after initializing all the packages and calling useEffect method to get one's leave and all the holidays, built a return method that shows employee name, leave type, reason for leave, start and end date, number of leave days, and status of approval. The method shows an overview of the leave taken by an employee.

```

import React, { useState, useEffect } from 'react';
import axios from 'axios';

const LeaveStatus = () => {
  const [leaveStatus, setLeaveStatus] = useState([]);
  const [employeeName, setEmployeeName] = useState('');

  useEffect(() => {
    const fetchLeaveStatus = async () => {
      try {
        const response = await axios.get('/api/leave/status');
        setLeaveStatus(response.data);
      } catch (error) {
        console.error('Error fetching leave status:', error);
      }
    };

    fetchLeaveStatus();
  }, []);

  return (
    <div>
      <p>Employee Name: {employeeName}</p>
      <table border="1">
| Name | Leave Type | Reason | Start Date | End Date | No. of Days | Status |
| --- | --- | --- | --- | --- | --- | --- |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 1 day from 11/05/2023 to 12/05/2023. | May 11, 2023 | May 11, 2023 | 1 | Approved |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 2 days from 13/05/2023 to 14/05/2023. | May 13, 2023 | May 14, 2023 | 2 | Approved |
| Hakkar Shams | Sick Leave | This sick leave was applied for the period of 2 days from 15/05/2023 to 16/05/2023. | May 15, 2023 | May 16, 2023 | 2 | Approved |

```

Figure 5.19: Leave status code 1

```

import React, { useState, useEffect } from 'react';
import axios from 'axios';

const LeaveStatus = () => {
  const [leaveStatus, setLeaveStatus] = useState([]);
  const [employeeName, setEmployeeName] = useState('');

  useEffect(() => {
    const fetchLeaveStatus = async () => {
      try {
        const response = await axios.get('/api/leave/status');
        setLeaveStatus(response.data);
      } catch (error) {
        console.error('Error fetching leave status:', error);
      }
    };

    fetchLeaveStatus();
  }, []);

  return (
    <div>
      <p>Employee Name: {employeeName}</p>
      <table border="1">
| Name | Leave Type | Reason | Start Date | End Date | No. of Days | Status |
| --- | --- | --- | --- | --- | --- | --- |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 1 day from 11/05/2023 to 12/05/2023. | May 11, 2023 | May 11, 2023 | 1 | Approved |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 2 days from 13/05/2023 to 14/05/2023. | May 13, 2023 | May 14, 2023 | 2 | Approved |
| Hakkar Shams | Sick Leave | This sick leave was applied for the period of 2 days from 15/05/2023 to 16/05/2023. | May 15, 2023 | May 16, 2023 | 2 | Approved |

```

Figure 5.20: Leave status code 2

```

import React, { useState, useEffect } from 'react';
import axios from 'axios';

const LeaveStatus = () => {
  const [leaveStatus, setLeaveStatus] = useState([]);
  const [employeeName, setEmployeeName] = useState('');

  useEffect(() => {
    const fetchLeaveStatus = async () => {
      try {
        const response = await axios.get('/api/leave/status');
        setLeaveStatus(response.data);
      } catch (error) {
        console.error('Error fetching leave status:', error);
      }
    };

    fetchLeaveStatus();
  }, []);

  return (
    <div>
      <p>Employee Name: {employeeName}</p>
      <table border="1">
| Name | Leave Type | Reason | Start Date | End Date | No. of Days | Status |
| --- | --- | --- | --- | --- | --- | --- |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 1 day from 11/05/2023 to 12/05/2023. | May 11, 2023 | May 11, 2023 | 1 | Approved |
| Hakkar Shams | Casual Leave | This casual leave was applied for the period of 2 days from 13/05/2023 to 14/05/2023. | May 13, 2023 | May 14, 2023 | 2 | Approved |
| Hakkar Shams | Sick Leave | This sick leave was applied for the period of 2 days from 15/05/2023 to 16/05/2023. | May 15, 2023 | May 16, 2023 | 2 | Approved |

```

Figure 5.21: Leave status code 3

5.3 MVC Pattern

Large-scale web applications may be organized using the Model View Controller (MVC) design, which also supports Asynchronous Method Invocation (AMI). Additionally, it offers a quicker development process and is easily adaptable. Furthermore, it is a fantastic tool for reducing code duplication since using the MVC pattern makes planning and maintenance simple. Nevertheless, because MVC frameworks deliver data without formatting, it is advantageous for developers because identical

components may be used with any interface. It is simple to develop several view components for the model using the MVC architecture. However, the MVC architecture strongly encourages the creation of web applications that are search engine friendly. Therefore, using the MVC design pattern to create web apps is a brilliant idea.

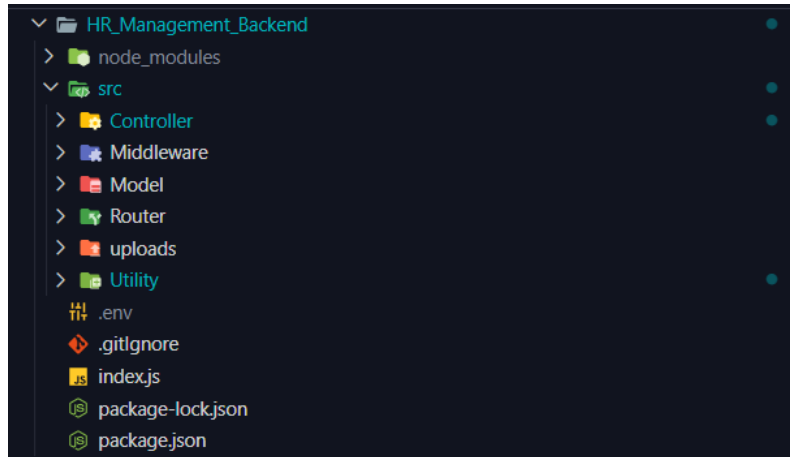


Figure 5.22: MVC pattern

5.4 Database Connection

MongoDB is a widely used database management system that utilizes a scale-out architecture, making it suitable for developing scalable applications that involve dynamic data schemas. MongoDB, being a document database, enables developers to effortlessly store both structured and unstructured data in an orderly manner. The storage of documents follows a structure that bears resemblance to JSON. Additionally, Mongoose is a software package available on the npm registry that encompasses an Object Data Modelling (ODM) library designed specifically for MongoDB. Mongoose provides a straightforward approach based on schemas for the modeling of application data. The built-in functionalities include type casting, validation, query generation, business logic hooks, and several other capabilities.

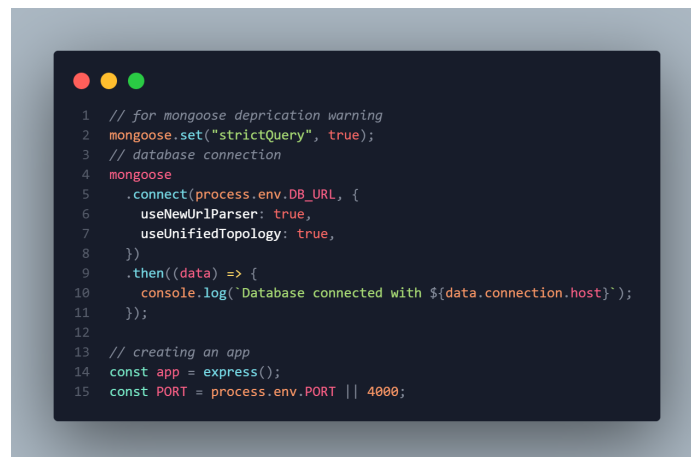


Figure 5.23: Database connection

Chapter 6

Testing Strategies

To verify a product is fit for its intended use, testers employ several procedures. Methodologies for testing products often include ensuring they function as intended, cause no harmful impacts outside of their intended uses, and can fail safely in the worst-case scenario. We employ a wide variety of testable approaches. Listed below are various techniques, each of which is briefly explained.

6.1 Black-box Testing

Black-box testing is a method of testing where the tester has no visibility into the inner workings of the application being tested. No knowledge of the system architecture or access to the underlying code is available to the tester. During a black-box testing procedure, the tester often engages with the system's user interface by providing inputs and assessing the resulting outputs without having any prior knowledge of the system's inner workings.

6.2 White-box Testing

White-box testing involves a comprehensive examination of the internal mechanisms and operations of software. White-box testing, also known as glass testing and open-box testing, refers to a software testing technique. White-box testing necessitates the tester to possess a comprehensive understanding of the internal mechanisms and operations of the program. The evaluator is required to analyze the code in order to identify the specific unit or area of the program that is displaying the erroneous performance.

6.3 System Testing

In system testing, a comprehensive analysis is conducted on all aspects of the system. After all the parts have been put together, the application is tested thoroughly to ensure it lives up to the quality standards set out. This kind of assessment is handled by a dedicated testing group.

6.4 Functional Testing

We carried out functional testing to ensure that a software program carried out its intended functions in accordance with the requirements outlined in the design specifications. During the functionality testing phase, we verify a variety of aspects of the program, including the main application functionalities, text input, menu operations, installation and configuration on localized devices, and more.

6.5 Alpha Testing

The initial round of testing will be carried out internally by the development and quality assurance groups. Alpha testing is a synthesis of the three separate types of testing such as unit testing, integration testing, and system testing. The application will be taken through its paces in this phase by being tested for the following features.

- Errors in syntax.
- Links that are no longer working or broken links.
- Perplexed paths or methods.
- The software will be examined on low-end hardware to check for loading and lag issues.

6.6 Beta Testing

After alpha testing is complete, this test is carried out. In beta testing, users who are representative of the target demographic evaluate the software. Pre-release testing (or beta testing) is another name for the same thing. In order to provide the application with real-life testing and provide an overview of the upcoming release, beta test copies of the software should preferably be released to a large audience on the Internet.

Chapter 7

Growth

7.1 Professional Growth

Acquiring professional experience, regardless of its nature, has the potential to enhance an individual's self-assurance and skill set. However, the job experience obtained through a professional internship is particularly noteworthy due to its capacity to expedite one's career progression.

7.1.1 Team Work

Collaboration among team members is a crucial factor in achieving significant accomplishments. I experienced a profound emotional response subsequent to my employment at Masterkey Technologies. Through collaboration, I have gained a deeper understanding of cooperation and the functioning of a team. Furthermore, I had the opportunity to join a team and gain firsthand experience in the dynamics of collaboration.

7.1.2 Leadership Responsibilities

Throughout the duration of my internship, I have actively engaged in the development, testing, and enhancement of web-based applications for the organization. In addition, I have established development strategies and test plans and executed unit, integration, and regression testing. I have successfully implemented and upheld coding standards, while also streamlining manual processes through automation. I possess experience in the development of prototype programs and the design of user interfaces. I have effectively managed and enhanced existing web apps. I have engaged in the activities of data modeling and mapping, and have assumed the role of a member within many technical panels as well as taskforces. I possess experience in the creation and management of technical documentation, encompassing user documentation, software development, and technological standards. I have consistently upheld and augmented my understanding of contemporary technology and emerging trends.

7.1.3 Time Management

During the instruction period, I acquired knowledge of the principles of time management and the need to adhere to deadlines. Additionally, I acquired the skill of adhering to deadlines and effectively submitting projects in a timely manner. My ability to perceive and manage time has significantly enhanced subsequent to my employment at Masterkey Technologies.

7.2 Technical Growth

My technical abilities and understanding have significantly enhanced since my enrollment in this program. Upon joining this organization, I received the opportunity to familiarize myself with a multitude of novel technologies that were previously unfamiliar to me. This internship has provided me with an excellent opportunity to acquire a diverse range of technology skills. I possess a strong sense of assurance in my capacity to effectively employ these skills in any forthcoming endeavors. During the course of my internship, I have acquired significant technical knowledge in several areas. The ensuing list highlights some of the key areas in which I have demonstrated improvement.

7.2.1 Git

Collaborative efforts within our team are focused on a shared project, necessitating the utmost importance of code synchronization. GitHub was utilized as a means of project management. During my learning experience, I acquired knowledge on the synchronization of projects with other contributors, namely through actions such as pushing to git, merging, and resolving disputes.

7.2.2 Responsive and Mobile-First Design

I have acquired the knowledge and skills necessary to develop websites that exhibit optimal functionality and compatibility across a diverse range of resolutions and machines. It is imperative to comprehend the fundamental tenets of responsive design and recognize the significance of beginning the design process with a mobile-first perspective.

7.2.3 Libraries and Extensions

I have acquired knowledge pertaining to a diverse range of libraries, packages, and extensions utilized in the field of web development. Libraries such as Tailwind and Daisy UI contribute to the development of high-quality code. In addition, the utilization of extensions such as prettier and live server has been found to effectively reduce the time required for coding tasks. These resources are highly beneficial for the advancement of a project.

7.3 Interpersonal Growth

Relationship improvement may be like self-discovery. This journey transcends our identities and connects us to the changing world. This review examines how interpersonal growth improves relationships, emotional intelligence, and self- and environmental awareness.

7.3.1 Questioning

The capacity to properly pose and articulate inquiries is essential for comprehending and assimilating knowledge in a personalized manner. Throughout the duration of my internship, I consistently observed that my supervisor made deliberate efforts to impart knowledge and skills to me. In instances, when I encountered concepts or information that were unclear to me, I proactively sought clarification by posing questions until I achieved a comprehensive understanding.

7.3.2 Logical Argument

During the process of delivering a presentation, I made an effort to express my concept in a coherent and rational manner. I have consistently endeavored to refrain from employing flawed logical methodologies, as they tend to engender confusion among individuals regarding my underlying beliefs. Throughout the initial weeks of my internship, my supervisor and I engaged in regular and substantive dialogues pertaining to the subject at hand.

7.3.3 Problem Solving

Organizations strongly respect individuals who possess the capacity for critical thinking and resourcefulness. This does not imply that one must possess the correct response to every inquiry. The crux of the matter is in cultivating a cognitive framework and adopting a mentality conducive to effectively addressing challenges encountered in arduous situations. During the course of our learning journey, my team and I encountered several challenges. The problem has been resolved via the dissemination of our collective knowledge. Additionally, we conducted a comprehensive study in order to explore potential solutions to a given problem from several angles. As a collective, the team is actively pursuing efficient and prompt resolutions. Therefore, the difficulties are resolved and the proficiency is enhanced via consistent practice.

Chapter 8

Conclusion

8.1 Conclusion

Within the context of the book, the acquisition of theoretical knowledge is the exclusive focus, devoid of any practical application. Consequently, the process of learning theory in isolation might be perceived as monotonous and unengaging. Over the last six months, this internship has afforded me the chance to use the information I have acquired thus far, which has been a really stimulating experience. Engaging in the process of constructing something captivating while acquiring knowledge is really enjoyable. The internship option has proven to be quite beneficial in facilitating the daily acquisition of new knowledge and skills. During my professional engagement, I encountered novel situations on a daily basis, necessitating the application of critical thinking and the adoption of alternative approaches. This endeavor significantly contributed to the enhancement of my experiential knowledge. I enjoyed practical experience in software development throughout my time at this institution. The project was successfully launched and received highly positive comments from the end customers. The projects on which I worked fostered a sense of responsibility and confidence inside me. The internship program facilitated the development of my capacity to effectively collaborate within a group context. Maintaining the coherence of a corporation's operations and recognizing the creative abilities and contributions of each team member are of utmost importance. I would like to express my sincere gratitude to my supervisor, Maruf Hasan, for his invaluable guidance during the course of this project.

8.2 Recommendations

Masterkey Technologies provides an excellent opportunity for individuals to get valuable professional experience. This organization offers an ideal work environment for those who possess a deep enthusiasm for creating extraordinary innovations. The overall aspects of this organization, including the office atmosphere, amenities, and work ethics, may be described as exceptional. I highly suggest this office to anybody seeking an internship opportunity at a distinguished establishment, where they may acquire new knowledge and skills under the guidance of exceptional executives.

8.3 Future Enhancement

The utilization of mobile applications has significantly enhanced the ease and convenience of engaging with internet platforms. In order to maximize the potential audience, it is necessary to develop an application that is compatible with both the iOS and Android operating systems. The utilization of local caching and access to the native application programming interface (API) enables the mitigation of data transmission and enhances usability, even in offline scenarios.

Bibliography

- [1] 19 Essential Tools for Front End Developers. (n.d.). <https://www.wearedevelopers.com/magazine/best-tools-for-front-end-development>
- [2] Express - Node.js web application framework. (n.d.). <https://expressjs.com/>
- [3] GeeksforGeeks. (2021). 12 Backend Development Tools For Web Developers. GeeksforGeeks. <https://www.geeksforgeeks.org/12-backend-development-tools-for-web-developers/>
- [4] Efti, S. (2022, May 11). How sales Leaderboards Help your team perform even better. Plecto. <https://www.plecto.com/blog/sales-performance/how-sales-leaderboards-help-your-team-perform-even-better/>
- [5] Department of Computer Science and Engineering (CSE). (n.d.). <https://dspace.bracu.ac.bd/xmlui/handle/10361/15989>
- [6] GeeksforGeeks. (2023). Benefit of using MVC. GeeksforGeeks. <https://www.geeksforgeeks.org/benefit-of-using-mvc/>
- [7] Usage statistics and market share of Bootstrap for Websites, July 2023. (n.d.). <https://w3techs.com/technologies/details/cs-bootstrap>
- [8] Bajracharya, R. (2018, February 16). Software Testing - Ranjan Bajracharya - Medium. Medium. <https://ran-bajra.medium.com/software-testing-534a477942fa>
- [9] Johnson-Dollie, T. (2021, September 29). How a career internship can boost your professional development. GVI. <https://www.gviusa.com/blog/how-a-career-internship-can-boost-your-professional-development/>
- [10] Onzain, M. (2018, June 27). 10 Interpersonal skills to land you that dream job | job and internship advice, companies to work for and more | WayUp blog. Job And Internship Advice, Companies to Work for and More | WayUp Blog. <https://www.wayup.com/guide/community/10-interpersonal-skills-to-land-you-that-dream-job/>