

INSTITUTE MANAGEMENT SYSTEM

PS1102: Practice School - II (PS2)

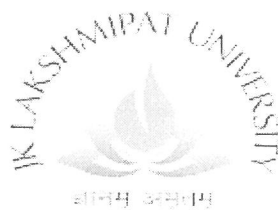
Prepared By

Yash Goyal(2018BTechCSE121)

Faculty Guide

Dr. Kshitiz Verma (Internal Mentor)

Prof. Sameer Kulkarni (Industry Expert)



**Department of Computer Science & Engineering
Institute of Engineering and Technology (IET)
JK Lakshmipat University, Jaipur**

July 2022

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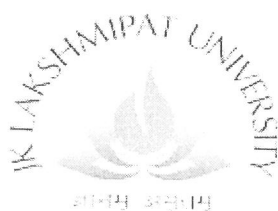
Submitted in partial fulfilment of the requirements
for the degree of
**Bachelor of Technology in Computer Science &
Engineering**

By

Yash Goyal(2018BTechCSE121)

Faculty Guide

Dr. Kshitiz Verma (Internal Mentor)
Prof. Sameer Kulkarni (Industry Expert)



Department of Computer Science & Engineering
Institute of Engineering and Technology (IET)
JK Lakshmipat University, Jaipur

July 2022

CERTIFICATE

This is to certify that the Practice School-2 project work entitled "**Institute Management System**" submitted by **Yash Goyal (2018BTechCSE121)**, towards the partial fulfillment of the requirements for the degree of **Bachelor of Technology in Computer Science Engineering** of JK Lakshmipat University, Jaipur is the record of work carried out by him under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for the Practice School-II examination.



Dr. Kshitiz Verma

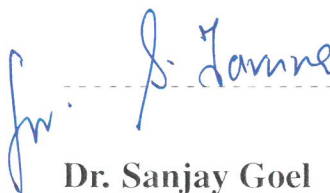
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Acknowledgements

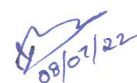
The internship opportunity I had with Indian Institute of Technology (IIT), Gandhinagar was a great chance for learning and professional development. Therefore, I consider myself as a very lucky individual as I was provided with an opportunity to be a part of IMS. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this internship period.

I would like to thank Prof. Dheeraj Sanghi, Vice Chancellor of JK Lakshmipat University for availing me this precious opportunity. I would also like to express my heartfelt gratitude to Dr. Sanjay Goel, Director, Department of Computer Science & Engineering for his valuable time and guidance that made the project work a success.

I extend my supreme gratitude to JK Lakshmipat University for providing such kind of opportunity for us students to broaden our perception on how the real world in the field of computer engineering looks like as well organizing the whole internship program and its effort to make sure that the whole internship program achieve its desired goals.

I would also like to express my special thanks to Prof. Sameer G. Kulkarni, Project Investigator of the Project and Neha Maheshwari, Deputy Project Manager of IMS at IIT Gandhinagar for giving me a chance to spend my practice in the university and helping me in my day to day activities during the intern time.

Finally, I would like to express my special thanks to my Dr. Kshitiz Verma, my Internal Mentor for the entire duration of this internship for helping me in all aspects and appreciate me to spend my all time in the work place during my internship time.



Sincerely Yours,
Yash Goyal (2018BTechCSE121)

Abstract

The main goal of this document is to discuss the Institute Management System at IMS Department in Indian Institute of Technology, Gandhinagar. This document discusses the development of Institute Management System which is an inhouse portal of IIT Gandhinagar and is an essential component of IITGN's infrastructure, with an aim towards a paperless office, to automate and streamline major IITGN operations. It is an ongoing project which uses framework and technologies like .Net, PHP, JavaScript, etc. The purpose of this system is to reduce humongous piles of paperwork, provide a platform for payments, course registrations, etc.

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Chapter 1

Introduction

1.1 About IMS

Institute Management System (IMS) is an essential component of IITGN's infrastructure, with an aim towards a paperless office, to automate and streamline major IITGN functioning admission process, fee payments, centralized data management, quicker accessibility of information about students (enrollment; course registrations; transactions; transcript), employees (finance and payroll; project proposal and expenditures), human resource and dashboards; recruitments; excellence nominations and so on.

1.2 Project Definition

In this project, there are certain tasks that the institution expects me to perform, such as:

- Script Writing
- VAPT (Vulnerability Assessment and Penetration Testing)
- UI/UX Improvement
- Web Development

1.2.1 Script Writing

In this, I have to write scripts for automating many tasks like automating backup of files, etc. The scripts can be written in any language such as Python, PowerShell, JavaScript, PHP, etc.

1.2.2 VAPT (Vulnerability Assessment and Penetration Testing)

VAPT is a term used to describe security testing that is designed to identify and help address cyber security vulnerabilities. It is a security testing to identify security vulnerabilities in an application, network, endpoint, and cloud. Both the Vulnerability Assessment and Penetration Testing have unique strengths and are often collectively done to achieve complete analysis.

Vulnerability Assessment scans the digital assets and notifies organizations about pre-existing flaws. Penetration test exploits the vulnerabilities in the system & determines the security gaps.

In this, I have to check various websites for any penetration attack such as SQL Injection, Cross-Site Scripting Attack, Brute Force Attack, etc.

Software programs which will be used for this are:

- Burp Suite
- Metasploit
- Wireshark
- Kali Linux
- Acunetix
- SQL Analyzer
- NMAP, and many more.

1.2.3 UI/UX Improvement

In this, I have to provide the suggestions regarding the improvements that can be performed in the IMS System and may have to develop some module for the same. The details entail making wireframes and providing brief design templates for suggesting improvements.

1.2.4 Web Development

In this, I have to develop any module of the IMS Website which is required by the institute.

Chapter 2

Methodology

2.1 Script Writing

2.1.1 PowerShell Backup Script

The purpose of this script was to upload the files to Google Drive automatically without user interaction again and again. In this script, all the files on the certain given path would be zipped, uploaded to google drive and then deleted(i.e., the zipped files) from the local system one by one. For this, GDrive API was used, which was developed for the purpose of handling Google Drive from the command line.

Steps:

- Step 1: First, I created a folder on Google Drive named by date and time.
- Step 2: Then, I iterated through all the files one-by-one in the given path and created an empty folder in the given path.
- Step 3: The purpose of the empty folder is to safely delete the desired files to avoid deleting any important file by accident.
- Step 4: Then, I used 7-Zip to zip the file (using the fast and most accurate zipping algorithm) and moved the zip to the created folder.
- Step 5: Then, I uploaded the zipped file to the created folder on Google Drive and deleted the zipped file from the folder on the local system.
- Step 6: This process is repeated for every file present on the path.
- Step 7: Then, after every file is uploaded, the folder on the local system is deleted to prevent file clogging.

2.1.2 PHP PDF Backup Script

The purpose of this script was to upload all the PDF files present in a directory to Google Drive automatically without user interaction again and again. In this script, all the PDF files on the certain given path would be copied to a folder, the folder will be zipped, uploaded to google drive and then deleted from the local system (both the zipped and unzipped one). For this, OAuth Client ID was used for handling the Google Drive from the command line.

Steps:

- Step 1: First, I created a folder on the local system named by date and time.
- Step 2: Then, I iterated through all the files and folders present in the specified directory recursively to search for all the PDF file present and created an empty folder in the given path.
- Step 3: Then, I copied the PDF files to the empty folder and zipped the empty folder.
- Step 4: Then, I connected the PHP code to Google Drive using OAuth Client ID.
- Step 5: A refresh token is generated automatically to prevent the session from expiring automatically to avoid creating the Client ID again and again.
- Step 6: Then, I uploaded the zipped file to the Google Drive and deleted the zipped file and unzipped folder from the local system.
- Step 7: Then, after the zipped file is uploaded, the folder on the local system is deleted to prevent file clogging.

2.1.3 Script for Special Character checking

The purpose of this script is to check whether a user inputs a special character in the text field and to find where the user has input the special character in the field. This script is written in JavaScript and JQuery.

Approach:

- Step 1: First, the text is captured from the text field.
- Step 2: Then, regex is used to find whether any special character is present.
- Step 3: If any special character is present, the characters found will be stored in an array and will then be matched from the string to find at which word the character is present.
- Step 4: Then using JQuery, the the stored character will be replaced by the character with some background color to highlight it in the text area.

2.2 VAPT (Vulnerability Assessment and Penetration Testing)

Currently, I am learning VAPT from online resources. There were some tasks given to me regarding VAPT.

2.2.1 Data Masking Verification

In this, data masking was implemented by the developer, and I was asked to check for any vulnerability in it using Brute Forced Attack. For this I used Burp Suite program to perform around, 90000 logins.

2.2.2 Testing of Cross-Script Attack on a URL

In this, I was given a URL, and was asked to perform various Cross-Site Scripting (XSS) Attacks on that URL. For this, I used Burp Suite program to perform XSS Attacks.

2.3 UI/UX Improvement

2.3.1 Wireframes

In this, I was asked to develop wireframes for the login and signup pages for the IMS Portal. Also, I was asked to develop wireframes for payment portal module. For wireframes, I used Figma Software.

2.3.2 HTML Pages

In this I was asked to develop HTML pages for Joining Report and Payment Module for IMS Portal. I used Bootstrap, HTML 5, CSS3, Javascript and JQuery 3.5.1 to make the HTML Pages.

1. Payment Module

In the Payment Module, there are 2 cards, one for the summary of user information along with the amount of the payment and the other is for the payment via three different payment methods, mainly - QR Code, UPI and PayTM.

2.3.2.1 User Card

This card is used to display the user information along with the fees details. In this card, bootstrap table is used to display 11 fields of information. The fields are:

- Roll No./ Application No.
- Name
- Programme
- Discipline
- Email ID
- City
- Mobile
- Academic Period
- Institute Fees
- Mess Fees
- Total Fees

The content inside this table is made by bootstrap making this card responsive.

This card is used for the payment operation by the user. This card contains three modes of payments: QR Code, UPI and PayTM. This card is divided into two sections, one contains the links for choosing payment mode and the other contains the payment operation.

- In this a QR Code is shown and a button is present to confirm the payment. If the payment is successful, then a card is shown with a payment successful message along with the payment method, transaction and order ID and the amount paid. If the payment fails, then a payment failed message is shown along with the button to try again by refreshing the QR Code.





Figure 2.3: QR_Successful Payment UI

- UPI:

In this a UPI input box is shown and a button is present to validate the UPI. If the UPI is validated, then again, UPI ID has to be entered. If the UPI is not successfully validated, then the user is asked again to validate the UPI ID. If the payment is successful, then a card is shown with a payment successful message along with the payment method, transaction and order ID and the amount paid. If the payment fails, then a payment failed message is shown along with the button to try again.



Figure 2.4: UPI Payment UI

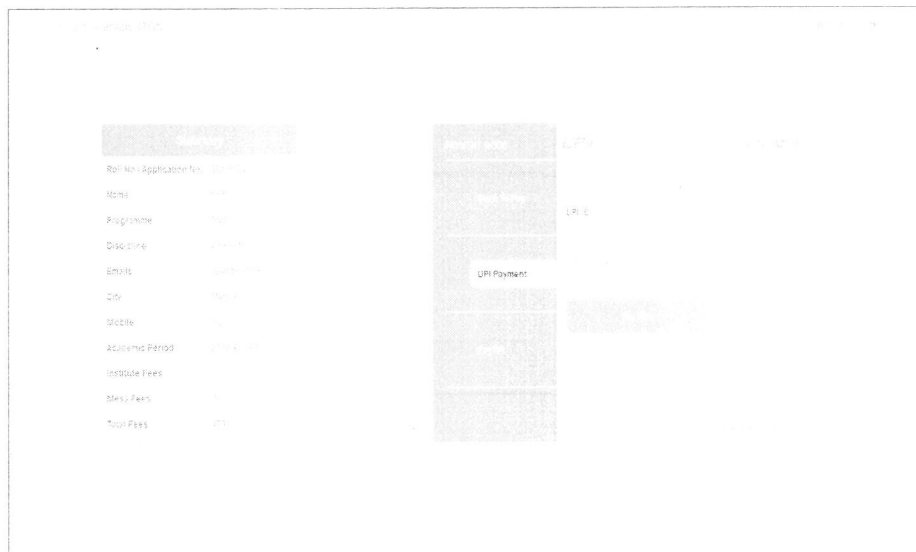


Figure 2.5: UPI_Validation_Successful Payment UI

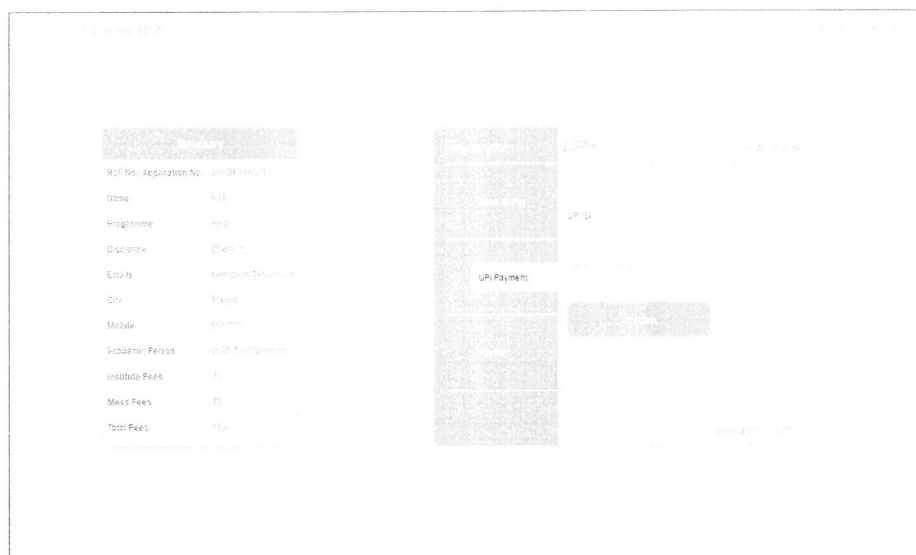


Figure 2.6: UPI_Validation_Fail Payment UI

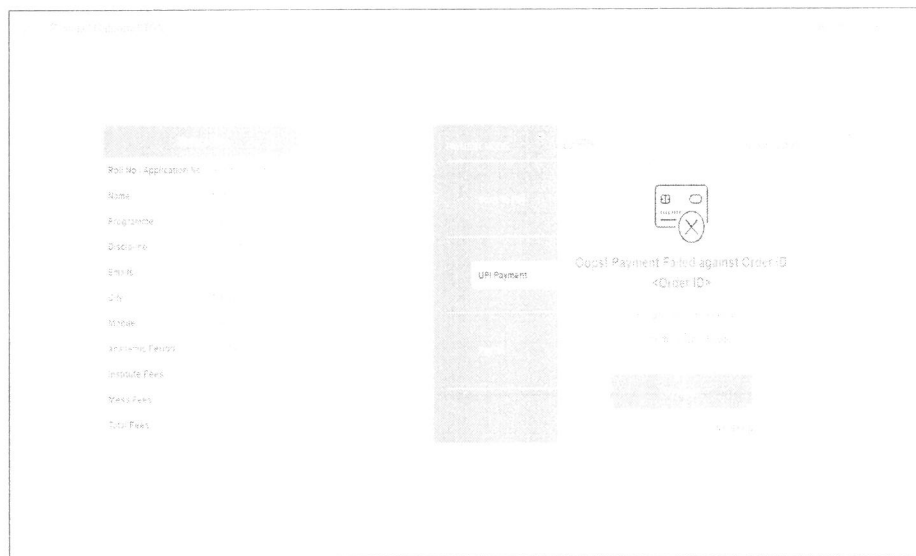


Figure 2.7: UPI_Fail Payment UI

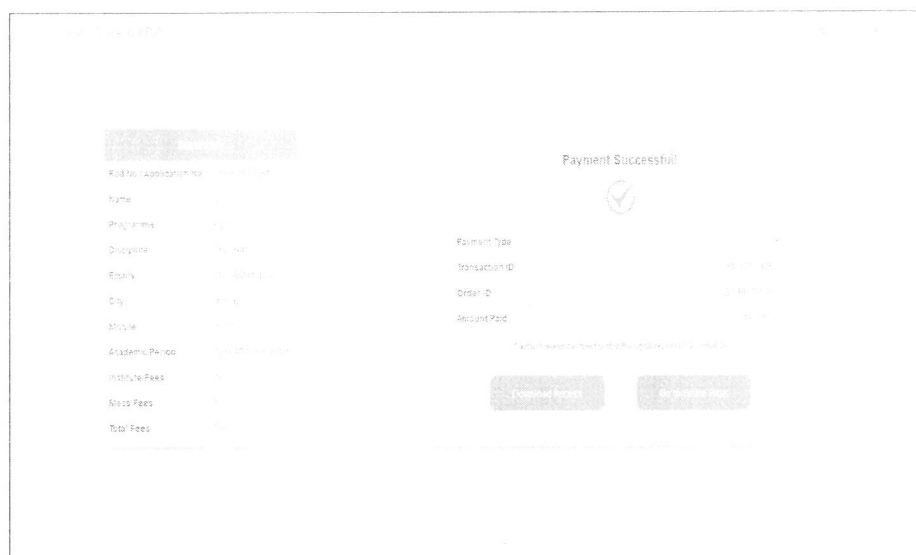


Figure 2.8: UPI_Successful Payment UI

- PayTM:

In this a button is present in the middle of the card. When the button is clicked, it redirects to the PayTM Gateway through which payment can be done by PayTM.

Figure 2.9: PayTM Payment UI

2. Joining Report

In the joining report, the template was to be made in HTML so as to convert it into PDF. HTML5 and CSS3 were used to make it. In this HTML table is used to create 27 rows for Name, Phone No., Address, Email ID, Signature of Employee, Dean, etc.

Figure 2.10: Joining Report

2.4 Web Development

2.4.1 Daily Status Report (DSR) Portal

Ims-DSR Portal is an essential module for the IMS Department and is used for keeping a track of the daily tasks performed by the employees at the IMS department. Before IMS Portal, the employees used to submit their daily tasks including their coming and leaving time through email, maintaining which was a cumbersome task. The employees used to manually enter every detail which was a time taking task. Many-a-times, the whole email thread is deleted by the employees, which makes submitting the DSR very difficult. By using the IMS Portal, employees can submit their DSR very easily and can see their previous filled DSR's also.

Features of Ims-DSR Portal are:

1. The employees can fill the DSR by just filling a form.
2. The employees can fill the tasks which were done by them today and the tasks which they have to do tomorrow.
3. The employees can also fill the reason if they are coming late or early to the office or any other remarks.
4. The employees can load their previous submitted tasks to save time.
5. The employees can add multiple tasks and save them as draft to submit it later on, saving their time.
6. When the employee enters the time duration of a task, the total time is dynamically calculated and displayed to the employee. Therefore, suppose an employee enters 3 tasks, then the total time duration of all the 3 tasks will be calculated and shown, informing the employee that he/she has worked for this many hours.
7. Also, when an employee enters the In and Out time in the form, the time duration is calculated and displayed to the employee. Thus, informing the employee that he/she spent this many hours in the office.
8. When the form is submitted, the form is disabled preventing the employee to submit the DSR again.
9. The employees can view their previously filled DSR's very easily. They can select the date for which they want to view the DSR(s).
10. The employees can view their detailed submitted DSR(s).
11. The employees can also download the DSR in excel format for a specific date period for easy communication.
12. The admin has the privilege to view the DSR(s) of any employee in the IMS Department and download and share it in excel format.
13. Daily, an email is triggered at 2 AM containing the DSR(s) filled by all the employees which is sent to the Project Investigator (PI).

This module was made using HTML, CSS, Javascript, Laravel (Framework of PHP). Laravel was specifically used as most of the modules in IMS are made using Laravel. Also, Laravel follows MVC architecture making it easier to develop.

DSR Admin Panel

Application

DSR Submission

DSR Dashboard

Task ID

Date

Time

Total Hours

Tomorrow's Task

Task Type

Miscellaneous

Remarks

Late due to equipment malfunction

Save as Draft

Submit

Figure 2.11: DSR Form

DSR Admin Panel

Application

DSR Submission

DSR Dashboard

Task ID

Date

Time

Total Hours

Tomorrow's Task

Task Type

Miscellaneous

Remarks

Late due to equipment malfunction

Save as Draft

Submit

Figure 2.12: DSR Form Save as Draft

DSR Admin Panel

Application: [Development/Testing] [05:15] [Ready for Staging] [Payment Gateway]

Total Task Hours: 05 Hrs 51 Min

Tomorrow's Task

Task Type: Miscellaneous

Remarks: [Placeholder text]

[Cancel Draft] [Submit]

Page 1 of 1

Figure 2.13: DSR Form Submit 1

DSR Admin Panel

Employee Name: [Placeholder text]

Date: [Placeholder text]

Total Hours: 7 Hrs 4 Min

Today's Task

Task Type	Task Status	Details
[Placeholder text]	[Placeholder text]	[Placeholder text]
[Placeholder text]	[Placeholder text]	[Placeholder text]

Page 1 of 1

Figure 2.14: DSR Form Submit 2



Figure 2.15: DSR Dashboard

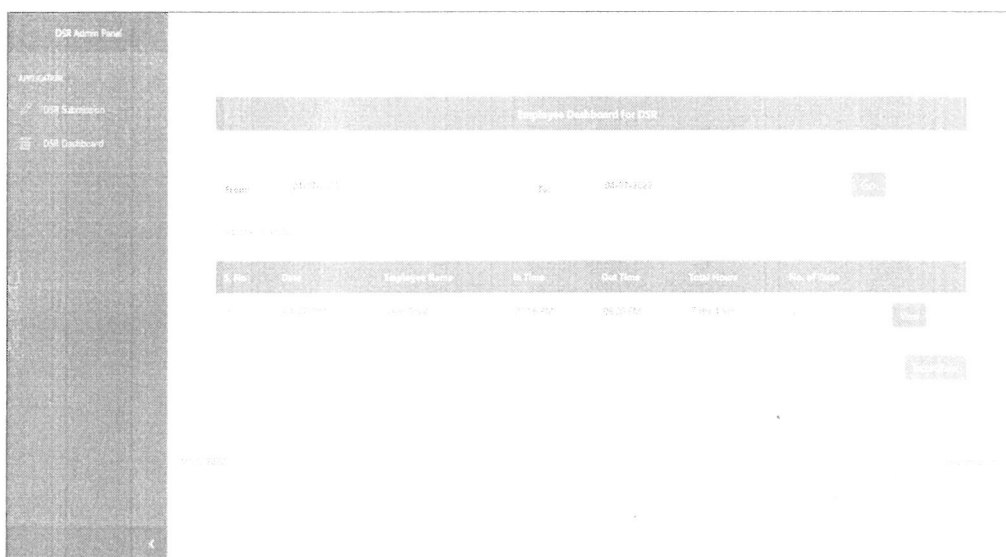


Figure 2.16: DSR Dashboard with Entry

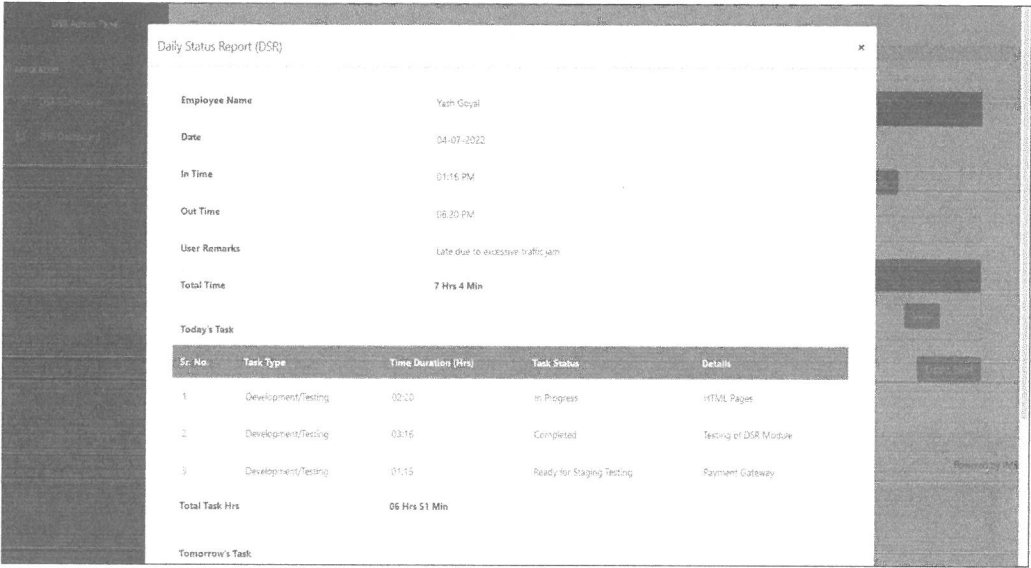


Figure 2.17: DSR Dashboard View 1



Figure 2.18: DSR Dashboard View 2

Sr. No.	Emp. Name	Date	In Time	Out Time	Total Hours	Task Type	Time Duration(hrs)	Task Details	Task Status	Task Mode	User Remarks
1	Yash Goyal	2022-07-04	13:16	20:20	7:4	Development/Testing	02:20	HTML Pages	In Progress	today	
						Development/Testing	03:16	Testing of DSR Module	Completed	today	
						Development/Testing	01:15	Payment Gateway	Ready for Staging Testing	today	
						Miscellaneous		Scripting		tomorrow	Late due to excessive traffic jam
						Total Task Hrs	6:51				

Figure 2.19: DSR Excel

2.5 Tools Used

The tools which were used till now are:

- Firefox Browser
- VS Code
- PowerShell
- JavaScript
- PHP
- Laravel
- Figma
- Burp Suite Community Edition
- XAMPP Server
- 7-Zip

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IIT
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INTERNSHIP CERTIFICATE

Date: [05.07.2022]

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Yash Goyal** has completed his internship as **Intern** at IMS, IIT Gandhinagar, from **10/Jan/2022** to **09/Jul/2022** for the duration of 6 months..

He has worked on the project titled Institute Management System (IMS). This project was aimed at facilitating a paperless office, to automate and streamline major IITGN functioning admission processes, fee payments, centralized data management, and quicker accessibility of information about students. As part of the project, he has created automation scripts, wireframes for UI improvement, and created a portal called Daily Status Report (DSR) for keeping a track of the daily tasks performed by the employees at the IMS department.

During his internship, he has demonstrated his skills with self-motivation to learn new skills. His performance met our expectations and he was able to complete the project.

We wish him all the best for his future endeavors.

Sameer G 06-07-2022

Prof Sameer G Kulkarni,
Project Investigator , IMS