SOFTWARE ENGINEERING

PROJECT REPORT

Project Title
Online LHC room booking system.

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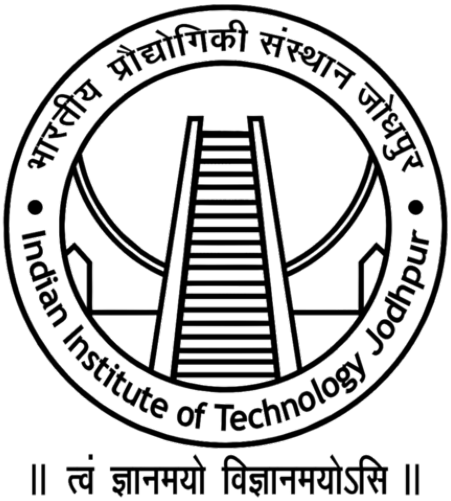
Document Type
SRS document



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
IIT JODHPUR

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0.PREFACE

"A PROJECT IS TEMPORARY ENDEAVOUR UNDERTAKEN TO CREATE A UNIQUE PRODUCT SERVICE OR RESULT."

The basic concept behind engineering is to use the scientific principles and maths to solve the real world problems and Engineers figure out how things work and find practical uses for scientific discoveries.

On the same note we tried to find out a real world problem from our surroundings and then we gave it a thought and as a software engineer we tried out to find the solution to the problem by designing a software which meets the specified problem.

We as students of Indian Institute of Technology, Jodhpur thought of the problems that campus residents, professors and students face and came up with a specific problem of Lecture Hall Room Booking. We know that there is a process to be followed for booking any room in LHC before conducting a workshop, seminar or any other gymkhana activity. The process usually is delayed, is cumbersome and monotonous which can be automated. As a software engineer we tried to come up with a solution of an online portal which meets the specified problem.

And here is the Software requirement specification document which defines the requirements of our software's design parameter and tells us about our software, what it will do and how it is expected to perform.
This is an important document both from the user and developer perspective.

1.INTRODUCTION

1.a CONTEXT

As a student of IIT Jodhpur we tried to pick up the problem from the IITJ campus only so that we can design and implement it hands on and also get user feedback very quickly. In this way we will learn and experience how to deal with a real world problem scenario and this will also help in benefiting the college in some aspect. This will ensure smooth functioning of gymkhana activities which will help students to develop their extra-curricular skills which will help them in their all round development.

The document states all the information and the specification of the software project. It describes various functionalities that it needs to fulfil for all stakeholders (business, users) needs and requirements. The designed software is supposed to meet the requirements of the documented problem and help to get a better system than the existing system with these changes. The project includes frontend, backend and database integration. The frontend will be made using React.js along with Node.js in backend. The database used is MongoDB. All the modules are well developed and tested and the application is bug less.

1.b.PROBLEM SPECIFICATION

- Inorder to organise an event in LHC the professors, staffs and students have to book the rooms in advance by informing the office well before the scheduled date to avoid any discrepancy.

- Sometimes it may happen that they have to visit the office inorder to know the schedule and available rooms and their timing.

- Manier times it happens that at the last moment the event has to either be postponed or cancelled because of the last moment information from the office.

So we decided to automate the process of booking where any person within or outside IITJ can book any available room of LHC from anywhere.

1.c SCOPE OF THE DOCUMENT

This document intends to describe the scope of the software for the user. The document meets the specified requirements of the user of the IITJ, they can be professors, staff or students.The software can be accessed by only those with an IITJ mail ID. The software designed is only responsible for the login and booking of any available room in the LHC building only.. The document doesn't provide any specification or take any responsibility about how the event will be organised and what functionality will be provided during the organisation of the event. Any issue during the event and related to it shall not be entertained, however our software team will always be there to help regarding the issue and difficulties related to login or booking.

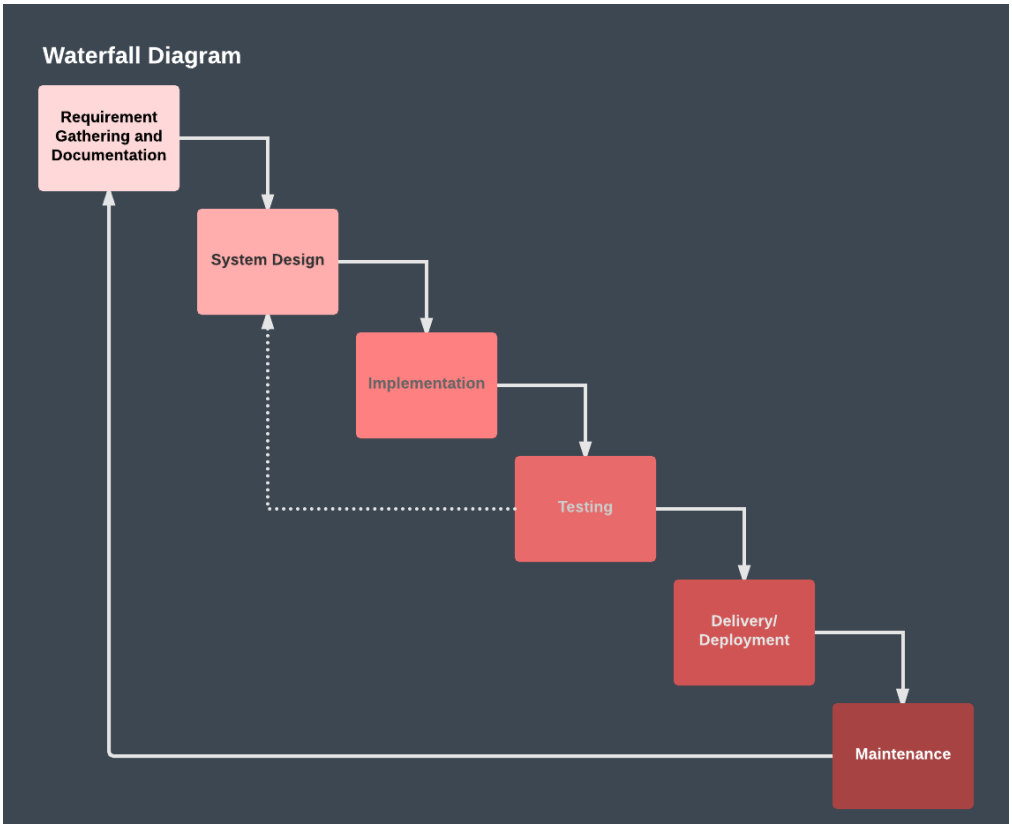
1.d.SUMMARY/OVERVIEW OF THE DOCUMENT

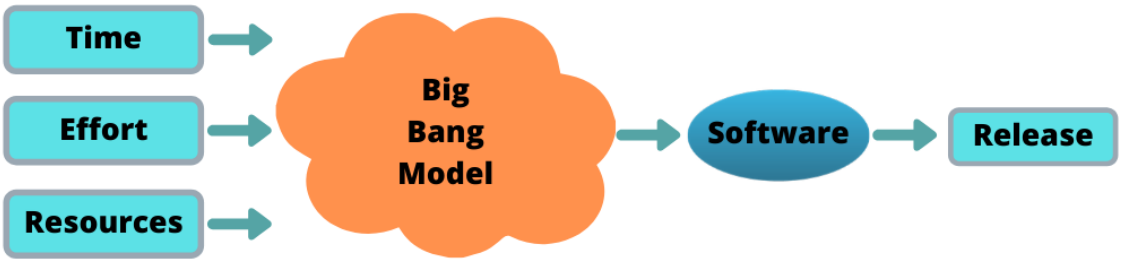
This document contains all the information and the specification of the software project. The document provides the functions, features and the build in details of the software along with the various requirements and constraints. It also describes the functionality the product needs to fulfill for all stakeholders (business, users) needs and Specific requirements. Also this document is intended to provide the user with the technical and functional knowhow of the software.

2.GENERAL DESCRIPTION OF THE IDENTIFIED PROJECT

2.a Workflow

For workflow, the software should follow the mixture of waterfall and big bang model as the project is on a small scale and these two models are very much effective for the small projects and the models are easily understandable.



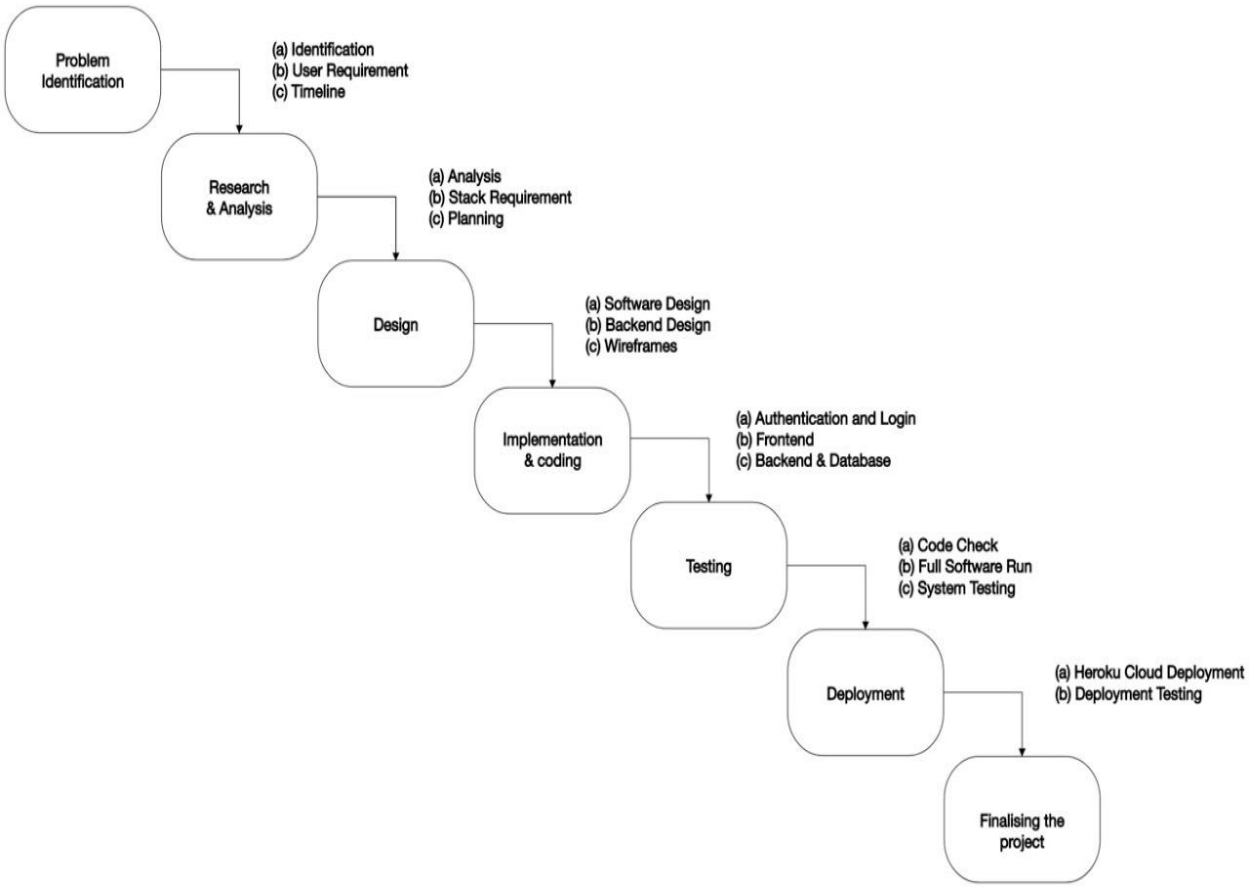


Big Bang SDLC MODEL

The flow of work should be done in following basic steps:

- Problem Identification and requirement analysis
- Research and Analysis
- Design
- Implementation and Coding

- Testing
- Deployment
- Finalising the Project



Problem Statement and Requirement Analysis

This phase is for identification of the problem from the surrounding and then collecting the information about requirements of the users.

Research and Analysis

This phase is all about the research part to know how we will proceed with the project, which things are required to build the functionalities demanded by the user and the analysis of them.

Design

The various parts of the project should be designed which includes UI design and the different wireframes.

Implementation and Coding

This phase includes the most important part of the software product which consists of writing the codes for the various modules of the software.

Testing

In this phase the software should be tested on various platforms and also in this phase a full system test should be done to find any bug. The full code should be checked to ensure everything is well and if there is any issue then resolve that.

Deployment

This phase includes pushing all changes and then deploying our final software project on some cloud. After the deployment a final test should be done to ensure that the software project should work fine.

User Feedback

In this phase feedback should be taken from the user side of how the software works on a real platform and also collect reviews and suggestions from the user side and work on them to resolve any conflicts.

2.b Use Cases/User Scenarios

Authentication

In order to use the functionalities offered by our software the user needs to authenticate themselves. The software should be deployed on the internal server of IITJ. In this case, users can authenticate themselves by connecting to IITJ LAN or Wifi by entering their LDAP ID and password. This also implies that only people with IITJ Mail ID can login to the website and book the room for an event. Professors, students, office staff are the only ones who can access the software.

Choosing Available Room

Once the user authenticates himself/herself, he/she will be shown a screen where they can select the date, time, location and capacity of the room. They can filter the available rooms based on this criteria. After filling the details they will be shown the available rooms and booked rooms. You will be able to book only those rooms which are available.

Booking the room

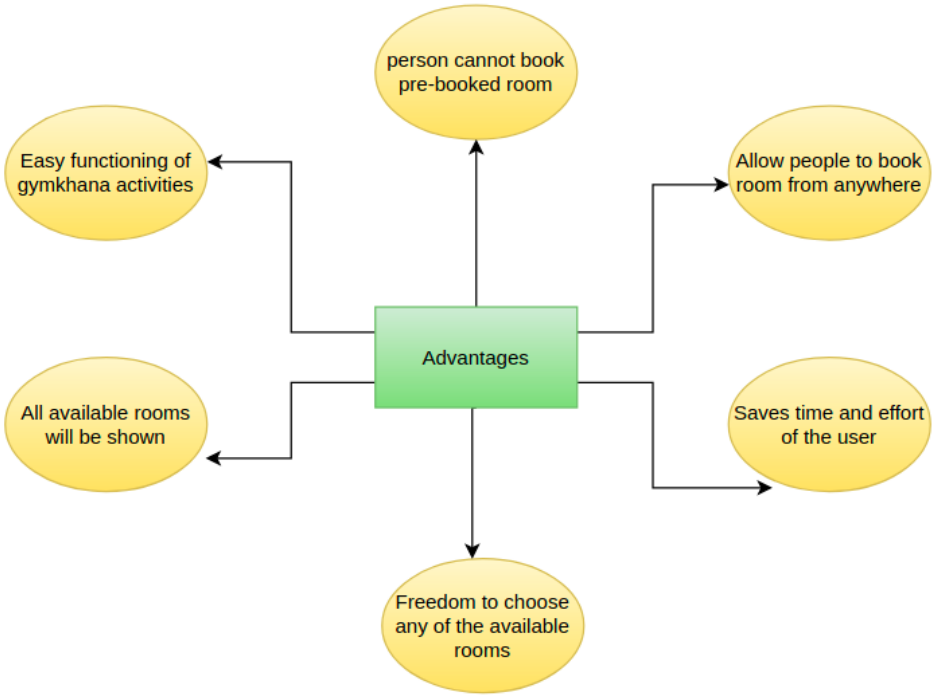
Once you select the room you want to book you need to fill in some details like Name, Contact no. and Mail ID which will be recorded during the booking. The user can then book the room by clicking on the book button.

NOTE: These use cases and scenarios are those which are assumed and proposed by the stakeholders and demanded by the users. The actual use case can differ somewhat from what is proposed.

2.c Overall Description of the software product

We made a web software in which we tried to give the following functionalities to the user through our software in order to book a room in LHC for any event.

- Provide an online platform for automating LHC room booking, to organize an event or program.
- All the available rooms will be shown.
- The user can choose any of the available rooms and book it for a particular period of time.
- Person cannot book a pre-booked room.
- Easy functioning of workshops, sessions, talks and gymkhana activities.
- Saving time and effort of the user, as they don't have to visit the office.



3.FUNCTIONAL REQUIREMENT

NOTE: The functional requirements are the requirements proposed by the stakeholders of the software and the user that are demanded by them and on actual implementation of the software some of the requirements may not be fulfilled by the team and may be ignored.

Authentication Module

The software should provide a login module which will ask the user to enter their email id and password in order to login to the homepage where they can book the slots for the rooms.

Selection of Date, Time, Location and Capacity

The software should provide us with an input field to select data, time, location and capacity of the room. It should also allow us to filter the available rooms based on this criteria. The software should be able to show the filtered results. The user can choose any date. The choices for selecting time lies between 8AM - 12PM consisting of 1 hour interval. The user can select out of three locations i.e. 1st Floor, 2nd Floor and 3rd Floor. It should also give options to select from a range of room capacities.

Display of available rooms for booking

After login into the webpage the software should be able to show all the rooms which are available as well as not available. The display of both the types of rooms should be different and presented in an intuitive manner. The available rooms are represented by circles and the booked rooms are represented by filled circles. Each circle represents a capacity of 50 members

A pre-booked room should be locked

The software should not allow the user to book a room which is pre-booked and it should be locked, that is the room should be in different color and the UI should not respond on clicking that room for booking or it should show some error message. Software should be designed such that it is clearly visible to the user that which rooms are pre booked and which are available.

Confirmation Mail

A confirmation mail is sent to the customer after a room is successfully booked so that he can be assured about the booking he made for that particular event.

4.INTERFACIAL REQUIREMENTS

User Interface requirement

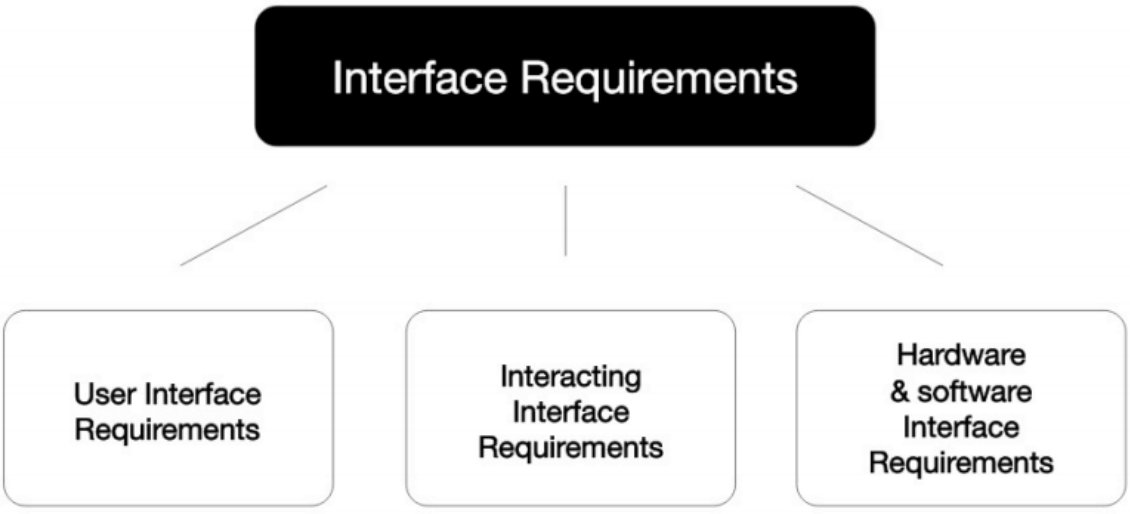
The user interface should be appealing and easy to use. The functions of the applications and how to use them should be intuitive to the user. It should be such that a wide variety of people can use it without any difficulty.

Interacting interface requirement

The user should be able to interact easily with the application using keyboard and mouse, keypad and trackpad or just using a mobile phone. The interaction is easy and can be done by all as the medium is readily available with everyone.

Hardware and Software interface requirement

The software interface should be supported in all the browsers and the hardware requirements should be so less that it can run even on the platform having constraint resources.



5.PERFORMANCE REQUIREMENTS

The software should perform equally well on all the local machines.

- It should perform effectively and optimally in all the cases without being crashed or slowed-down.
- The performance of the functionalities that is provided by the software should not be altered while the software is running.
- The software performs well even when multiple users are using it and it should serve them all equally well.
- The software modules should not intervene and alter each other's functionalities.
- The software should perform well even on less resources.
- The software should be time efficient, that is the different modules/pages of the website should be reloaded in a definite minimum amount of time.

6.DESIGN CONSTRAINTS

- The design of the software should be as simple as possible so that any person with less experience can also use the software easily. For eg. the staff members of IITJ may not have that much knowledge to use complex websites so it should be easy for them to learn and use the software.
- As different people use different browsers, our software should be designed such that it should run efficiently in all the browsers without any issue.
- The software is meant to remove any discrepancy among the user in booking of the rooms in LHC and for the user's comfort that the user should not go to the office for this and he can do it by himself from laptop/mobile. Thus the design should be designed such that it mainly focuses on these two issues.
- The software should be designed in such a way that different modules work independently and do not alter the processing of others.

7.NON FUNCTIONAL REQUIREMENTS / QUALITY ATTRIBUTES

A non-functional requirement / Quality attribute defines the performance attribute of a software_system.Identifying the appropriate quality attributes is critical in the quality management of services.
Some examples of Quality attributes are Scalability, Capacity, Availability, Reliability, Usability, Recoverability, Data Integrity, Security, Safety etc.
Some of the non-functional requirement which our software will provide are:

Reliability

The software should be reliable for the user. In our case if a user has booked a room in LHC then the software provides the functionality that he can rely on it and be assured that no one else is going to book that room for that particular period of time and his event can be conducted successfully.

Availability

The software should be available anywhere, anytime around the globe. Also it should be available to use for anyone with an IITJ email account without any bias or discrepancy. We can connect without using the IITJ wifi or LAN by using IITJ VPN services.

Scalability

The software should appropriately handle the increasing or decreasing workloads even when multiple users use it at same time.

Aesthetics

The user interface must be very easy and simple to use including the designing component such as the color palette, button colors, text alignments, icon placements etc.

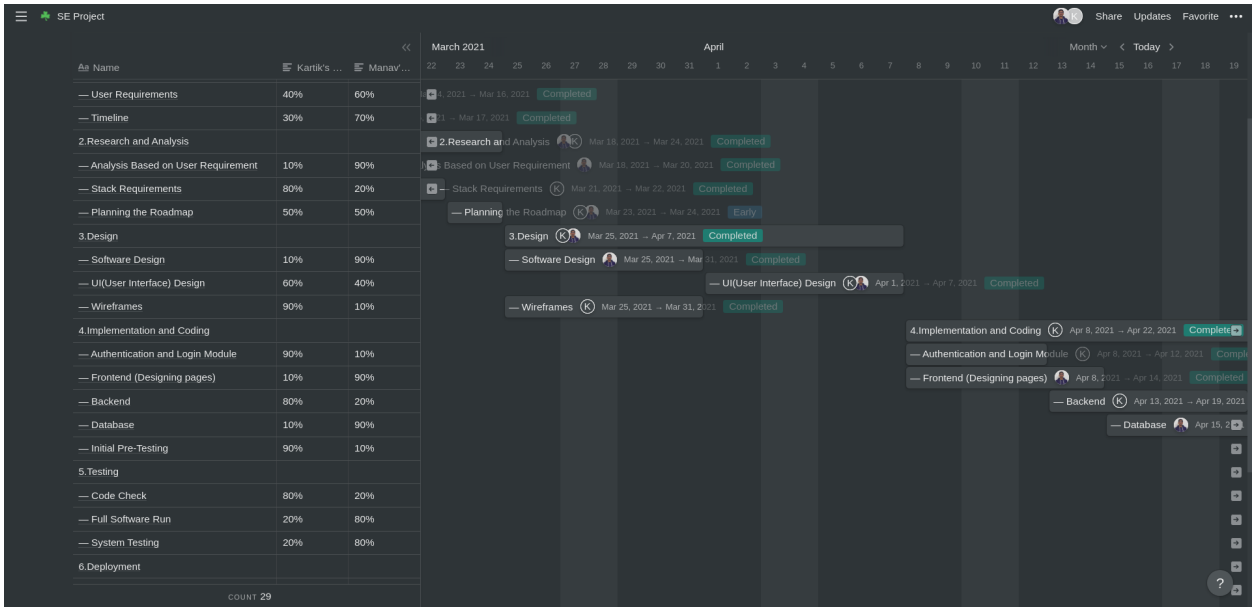
Usability

The software should support different variations of phones and ipads screen. It should also support all the versions of the current browsers like firefox, chrome, internet explorer and all the available operating systems such as Mac, Linux ,windows etc.

8.TIMELINE OF THE PROJECT

The Notion link for the timeline and schedule of the project - Notion link

Here is the screenshot of the notion workspace where we had designed the timeline and there is also mentioned the team member names for any particular task and the contribution of each member in that part of the project.



TASK	TIMELINE
Problem Statement and Requirement Analysis	11/03/2021-17/03/2021
Research & Analysis	18/03/2021-24/03/2021
Design	25/03/2021-07/04/2021
Implementation and Coding	08/03/2021-22/04/2021
Testing	23/04/2021-29/04/2021
Deployment	30/04/2021-01/05/2021
User Feedback	02/05/2021-05/05/2021

9.BUDGET ESTIMATE

JOB	CTC(LPA)	HIRES	DURATION	TOTAL COST
Designer	20	2	13 days	1,42,465
Developer	28	1	15 days	1,15,068
Coder	24	1	15 days	98,630
Tester	12	2	7 days	46,027
Deployer	16	1	2 days	8767
Total				4,10,957

NOTE: All the packages mentioned in the budget are hypothetically approximated and assumed for the purpose of this project only.

The budget estimated is **Rs. 4,10,957** with a total time duration of approximately **50 days** which(can be delayed if there are some problems encountered). The budget of our software project only accounts for Human resource expenses, no hardware expenses are required for this project as all other resources which we are using are free of cost and available online.

Thanking You
Course instructor - DR. Sumit Kalra