Nihareeka College of Management & Information Technology Tribhuvan University

LETTER OF APPROVAL

This is to certify that this project prepared by Komal Jha, Yunika Baniya, Aarushi Basnet titled "Tutor Management System" in partial fulfillment for the degree of B.Sc. in Computer Science and Information Technology has been well studied. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

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SUPERVISOR'S RECOMMENDATION

I hereby recommend that this project prepared under my supervision by the group (Komal Jha, Yunika Baniya & Aarushi Basnet) titled "Tutor Management System" in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Information Technology be processed for the evaluation.

.....

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continuous support and co-operation.

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IV

ABSTRACT

In the bustling educational landscape of Biratnagar, connecting students with suitable tutors posed a significant challenge. To address this, we have developed a Tutor Management System website tailored specifically for Biratnagar. This user-friendly platform facilitates effortless tutor discovery for students, streamlining communication and simplifying the tutor selection process. This project will revolutionized the way students seek academic assistance, providing a centralized and efficient system for connecting with tutors.

List of Figures

Figure No. Figure Name	PageNo.
Figure 1. Use case Diagram of Tutor Management System	9
Figure 2.ER Diagram of Tutor Management System	12
Figure 3.Context Level Diagram of Tutor Management System	13
Figure 4.DFD Level-1 of Tutor Management System	14
Figure 5.DFD Level-2 of Tutor Management System	15
Figure 6. Database Schema Design of Tutor Management System	16

List of Tables

Table NO.	Table Name	Page No.
Table 1 Gantt ch	nart of Tutor Management System	11
Table 2 Unit Tes	t Case for User Register	24
Table 3 Unit Tes	t Case for User Login	25
Table 4 Unit Tes	t Case for Admin Login	25
Table 5 Unit Tes	t Case for ADD, UPDATE, DELETE AND EDIT Tutors	26
Table 6 Unit Tes	t Case for Search Tutors	27
Table 7 System ⁻	Testing	28

LIST OF ABBREVIATIONS

CSS — Cascading Style Sheets

HTML — Hypertext markup Language

MySQL — My Structured Query Language

PHP — Hypertext preprocessor

RAM – Random Access Memory

SCLC —Software Development Life Cycle

VS code - Visual Studio Code

Xampp — Cross-Platform Apache MySQL PHP

TABLE OF CONTENTS

LETTER OF APPROVALII
SUPERVISOR'S RECOMMENDATIONIII
ACKNOWLEDGEMENTIV
ABSTRACTV
LIST OF FIGURESV
LIST OF TABLESVI
LIST OF ABBERVIATIONSVII
Main content
1. Chapter 1: Introduction
1.1 Introduction
1.2 Problem Statement
1.3 Objectives
1.4 Scopes and limitation
1.4.1. Scope
1.4.2. Limitation
1.5 Development Methodology4
1.6. Report Organization4
2. Chapter 2: Background Study and Literature Review
2.1. Background Study6
2.2. Literature Review6
3. Chapter 3: System Analysis
3.1 System Analysis

3.1.1 Requirement Analysis8
i. Functional Requirements9
ii.Non Functional Requirement10
3.1.2. Feasibility Analysis
i. Technical
ii. Operational
iii.Economic
iv.Schedule11
3.1.3. Analysis11
• Data modeling using ER diagram12
• Process modeling using DFD12
4. Chapter 4: System Design
4.1. Design
• Database Design
• Forms and Report Design
• Interface and Dialogue Design
4.2. Algorithm Details
5. Chapter 5: Implementation and Testing
5.1. Implementation
5.1.1 Tools Used
5.1.2 Implementation Details of Modules
5.2. Testing
5.2.1 Test cases for unit testing
5.2.2. Test cases for System Testing
5.3. Result Analysis

6. Chapter 6: Conclusion and Future Recommendations					
6.1. Conclusion.	29				
6.2.2. Future Recommendations	29				
REFERENCES					
APPENDICES					

Chapter 1

Introduction

1.1 Introduction

The Tutor Management System in Biratnagar is like a helpful guide that makes it easy for students to search for the perfect tutor in the Biratnagar area. This special system understands what each student needs and finds a tutor just for them. Most of the students who cannot find the tutor offline can visit to the website and search for the teachers according to the subject. They can contact with the tutor according to the details given in the teacher's profile. It's like a matchmaker for learning! With this system, learning becomes simpler, and students can get the help they need, making education in Biratnagar more accessible and enjoyable for everyone.

1.2 Problem Statement

In Biratnagar, it's hard for students to find the right tutors. The current methods are not very good. Students struggle to find tutors who can help them with what they need to learn. The current ways of finding tutors are not very fast or personalized. This makes students frustrated, and they don't learn well. Tutors, too, find it difficult to connect with students who need their help. This means students miss out on the chance to learn from great teachers, and tutors can't share their knowledge effectively. We need a better way in Biratnagar, a system that helps students find the right tutors easily and helps tutors reach the students who need them. Solving this problem is vital to make sure every student gets the help they need and every tutor can teach effectively, making education in Biratnagar better for everyone.

1.3 Objectives

- To improve the efficiency and effectiveness of the tutoring process.
- To enhance the learning experience for student.
- To increase the tutor availability and student engagement.
- To increase the collaboration between teacher and student.

1.4 Scopes and Limitation

1.4.1. Scope

- Managing the user's profile.
- searching teachers according to the subjects.
- Maintaining security and privacy of the user.

1.4.2. Limitation

The limitations are given below:

- Maintaining security and privacy of the user.
- Users should use suitable devices .
- Requirements are well documented and clear.

1.5 Development Methodology

The entire development procedure for this system is based on waterfall model.

The waterfall model was selected as the Software Development Lifecycle

(SDLC) model due to the following reasons:

- Requirements are well documented, clear and fixed.
- Product definition is stable.
- There are no ambiguous requirements.

The following illustration is a representation of the different phases of the Waterfall Model.

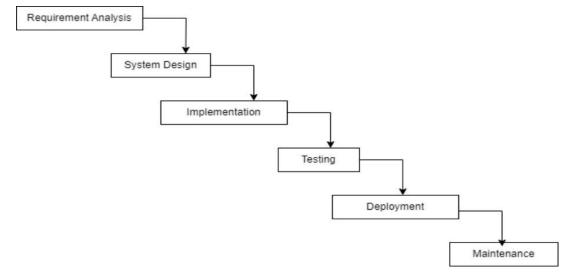


Figure 1. Waterfall Model

The phases in waterfall model are:

Requirement Gathering and analysis

Once the goal was set, data collection process began to get information about the Tutor Management System history and past works on this domain. Following methods have been used for data collection:

• Literature Analysis

Literature have been reviewed and critically analyzed to find what kind of works have been suggested in past. These works helped in tracking down the deficiencies of past arrangements and characterizing the point and destinations of the undertaking. For the most part, essential information has been gathered to fill the need. Be that as it may, sometimes, optional information is additionally utilized.

Observation

Number of tutor management website and Facebook pages have been reviewed to find the current trend in developing web application for Tutor Management System.

System Design

After data collection, an overview on the system has been gained. Then different methods (ER diagram, DFD, etc.) of Structure Oriented System and Design Methodology (OOADM) is used to analyze the system and make logical structure for it.

Implementation

In the wake of getting the sensible design of the framework, the execution step started. In this progression, the legitimate construction changed over to actual engineering through coding and improvement of the framework. The frontend and backend of the framework has been created and tried. The framework is first evolved in quite a while called units (register, login), which were incorporated. Every unit were created and tried.

Integration and Testing

All the units developed in the implementation phase were integrated into a system after testing of each unit. Post integration the entire system were tested for any faults and failures.

Deployment of system

Once the functional and non-functional testing were done; the product was deployed under domain localhost/TutorManagement.

Maintenance

There were no any issues which came after the deployment of the system.

1.5 Report Organization

on completion of our project development, we have documented milestones and the final report document has been organized under the following steps:

Chapter 1. Introduction

Chapter 2. Background Study and Literature Review

Chapter 3. System Analysis

Chapter 4. System design

Chapter 5. Implementation and Testing

Chapter 6. Conclusion and Recommendation

First Chapter consists of brief introduction of the given topic, problem statement, objectives, scope and limitation. Development methodology and report organization.

Second Chapter includes background study and literature review.

Third Chapter consists of system analysis. This system contains requirement analysis, feasibility analysis and analysis. The requirement analysis further contains functional and non-functional requirements and feasibility analysis contains technical, operational, economic and schedule.

Fourth chapter contains system design with design and algorithm details. The design contains some of diagrams related to either structured or object oriented.

Fifth chapter includes implementation and testing. It contains implementation, testing and result analysis. The implementation contains tools used and implementation details of modules and testing contains test cases for unit and system testing.

Sixth chapter gives conclusion and future recommendations.

Chapter 2

Background Study and Literature Review

2.1 Background Study

In the educational landscape of Biratnagar, traditional methods of finding tutors face significant challenges. With the increasing digitalization of education, there is a growing need for a more efficient and accessible way for students to connect with suitable tutors. The conventional approach, relying on local advertisements or word-of-mouth, is becoming less effective. Tutors and students in Biratnagar are struggling to find ideal matches for their learning needs. The traditional tutoring methods often lack efficiency and personalization. Additionally, the demand for specific subjects and skills is increasing, requiring a system that can cater to these diverse needs. To address these challenges, the Tutor Management System comes into play.

2.2 Literature review

The internet changed how students and tutors work together. Research shows that in online learning, it's crucial to match students with the right tutors for their subjects. This personalized matching makes learning more effective. We reviewed some available websites that have the same type of services, and their descriptions can be seen below:

a. Tutor Hunt

Tutor Hunt is an online tutoring platform that connects students with tutors across various subjects and academic levels. It allows students to search for tutors based on their location, subject requirements, and budget constraints. One common issue of the tutor hunt is the limited availability of tutors, particularly during peak periods, which can restrict student's options [1].

b. Classpro.in

Classpro.in is an online platform designed to streamline and automate various administrative tasks for coaching institutes and educational centers. One of the major problem in the website is that the teachers who are not from the

certain educational centers and institute cannot guide the students. Here the findings of the teachers for the specific area is difficult ^[2].

c. Repetitor-general.info

It is the online platform of finding the teachers. The student can directly contact to the teachers through the email. It is widely available in different countries, it is also available for the country Nepal. One of the major problem in this website is that the only student can search for the teachers but the teachers cannot search the students [3].

d. TutorBird

TutorBird likely offers a platform where students can find tutors for various subjects and topics. These tutors may cover a wide range of subjects, from academic subjects like mathematics and science to skills like language learning or music lessons [4].

e. TeachWorks

Teachworks is a comprehensive management software tailored for tutoring businesses and educational institutions. This platform streamlines various aspects of running a tutoring service, offering tools to manage schedules efficiently^[5].

After studying the existing system, our proposed Tutor Management System in Biratnagar aims to bridge these gaps. By addressing the limitations of existing platforms, our system strives to enhance tutor availability, offer opportunities to educators regardless of institutional affiliations and the teachers can also contact to the students.

Chapter 3

System Analysis

3.1 System Analysis

System analysis is conducted for the purpose of studying a system or its parts in order to identify its goals. It is a problem solving technique that improves the system and ensures that all the modules of the system work efficiently to achieve their purpose.

3.1.1 Requirement Analysis

To create web application there should be the requirement analysis to be done. Software and hardware requirements analysis is done. Two types of requirement analysis are done as functional and non-functional requirements. Both of them are as given below:

i. Functional Requirement

Functional requirement for this applications explains how the system must work. It inclines the outline of workflows performed by system, function performed by specific screen.

The Functional requirement of this application can be listed as:

a. Visit web application

The user should be able to visit the web application through the website. The application should be freely available.

b. User Registration

The user should be able to register in the web application. The user must provide email, password and confirm password.

c. User Login

Given that a user has registered, then the user should be able to log in the mobile application through his/her email and password.

d. Admin Login

Admin should be able to login to manage the web application and manage the tutors details of the manage the process of the system.

e. Home Activity

Given the user is logged into the web application, then first page that is shown should be home activity. The user get references to all other actives like searching the tutors, getting details of tutors, booking tutors and contact.

The admin should add the tutor details and manage then along with keeping the details of tutors and their subjects.

F. Logout

The user should be able to logout from the system.

Use Case Diagram

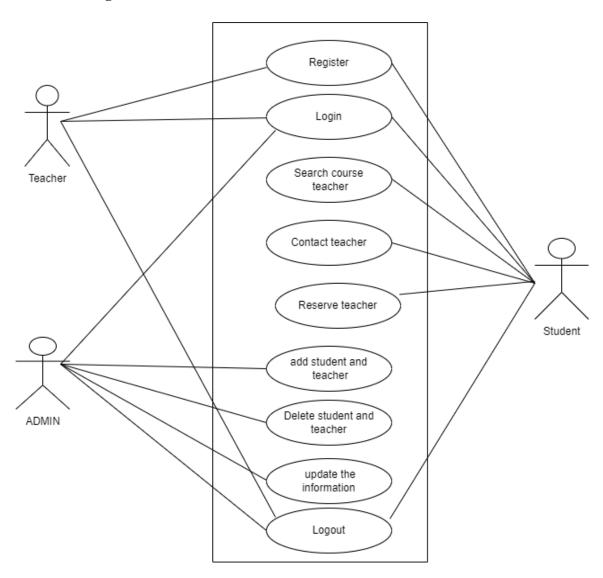


Figure 1.Use case diagram for the Tutor Management System

ii. Non-Functional Requirement

The non-functional requirements of this application describes how the system works or that specifies criteria that can be used to judge the operation of a system. It also describes system attributes accessibility, security, maintainability and usability.

Accessibility: The system is easily accessible from anywhere with the use of internet. Anyone with the login credential can access their needs from anywhere through internet. Data is available 24 x 7 if connected with internet.

Maintainability: The application is easy to maintain. It supports further extension of other functionalities as needed. System has easy code base that helps to troubleshoot problems easily if occurred in future.

Look and Feel: System has different user interface for different users according to their access privileges. Different UI simplifies the user role. Users will have their own well-designed dashboard. UI is simple and easy to use.

Security: There is security of the communication between user and system. Only authenticated users are allowed to access the dashboard. No two users with same email can register on the site.

3.1.2 Feasibility study

While analyzing the project we must have to think about either our project is feasible or not.

i. Technical Feasibility

The system can be developed using our own laptops. Moreover, the software technologies that we are using are all free and open source. Hence, our project is technically feasible.

ii. Economic Feasibility

We can easily afford the software and hardware requirements. Hence, our project is economically feasible.

iii. Operational Feasibility

In terms of operations, the Tutor Management System simplifies the process of searching for tutors, noting their details, and managing the list of available tutors based on specific needs. The system's user-friendly interface enables seamless

operations, making tasks such as adding tutors and organizing educational resources straightforward.

iv. Schedule Feasibility

The schedule of our project is given in the following Gantt's chart:

Table 1: Gantt chart of Tutor Management System

	4 months							
Development								
phase								Duration
	0-20	20-40	40-60	60-80	80-10	00	100-120	
Requirement								14
Gathering &								
Analysis								20
Designing								30
Designing								
								40
Coding								
								20
Testing								
Implementation &								16
Deployment								
Total	14	30)	40		20	16	120

3.1.1. Analysis

• Data Modeling

The Data Model presents the logical organization of data without indicating how the data are stored, created or manipulated so that analysis can focus on the business without being distracted by technical details. It is the process used to define and analyze data requirements needed to support business process within the scope of an organization.

ER diagram

The entity relationship diagram of the system is given below:

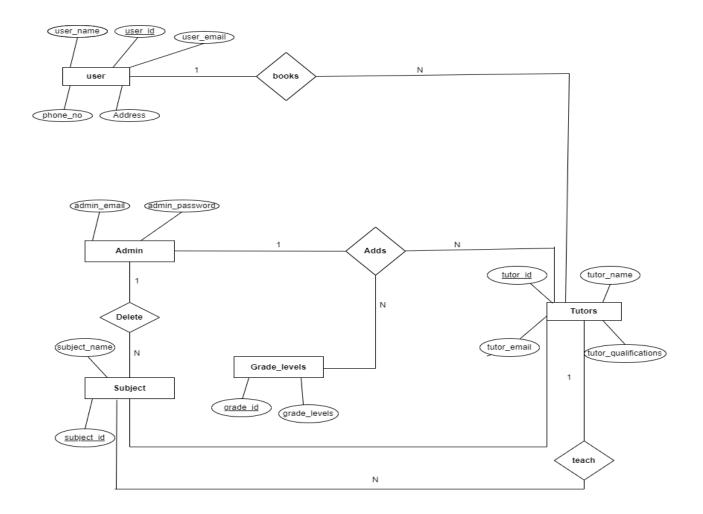


Figure 2: ER-Diagram of Tutor Management System

In the above er-diagram there are four entity such as user, grade, subject and tutor. Each entity has its own attribute and primary key.

The figure simply shows entity user has role and he/she books tutor and tutor has subject. Each user has its own role which is separate by its id, according to that id user can performed different action. This figure shows that one user has many tutor, one tutor teaches many subjects whereas admin can add grade, subject and tutor.

• Process Modeling (DFD)

Data Flow Diagrams show the flow of data from external entities into the system, and from one process to another within the system. Following are the Data Flow Diagrams for the current system. The Context Level DFD provides a conceptual view of the process and its surrounding input, output and data stores. The Detailed DFD provides a more detailed and comprehensive view of the interaction among the sub processes within the system which is explain in the below figure.

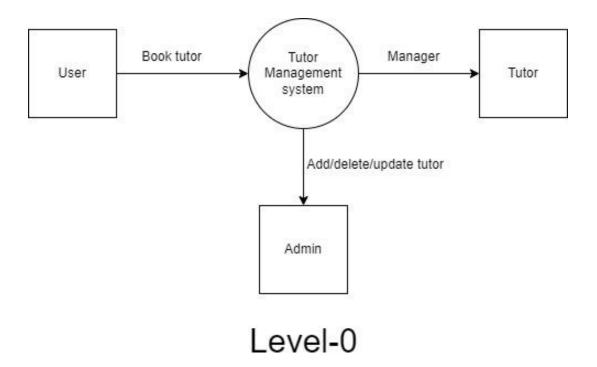


Figure 3: Context diagram of Tutor Management System

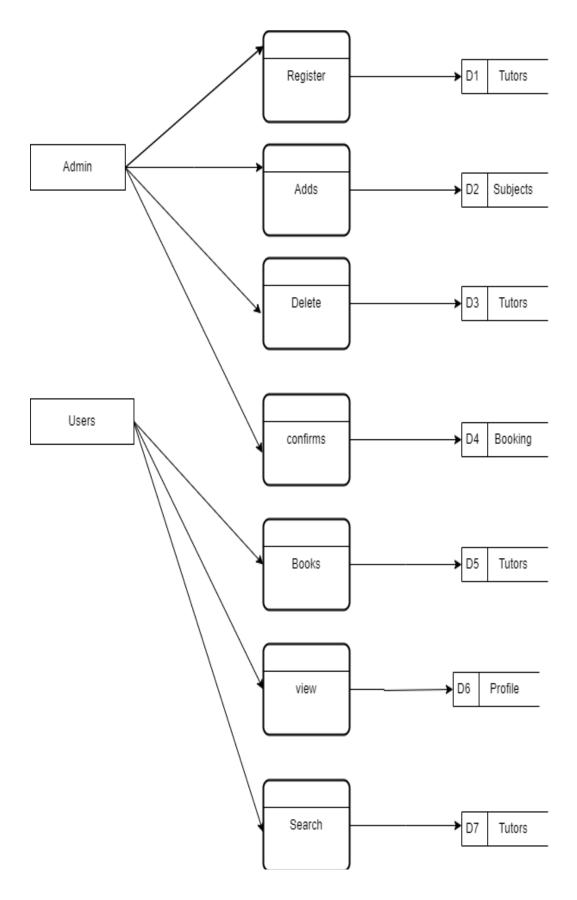
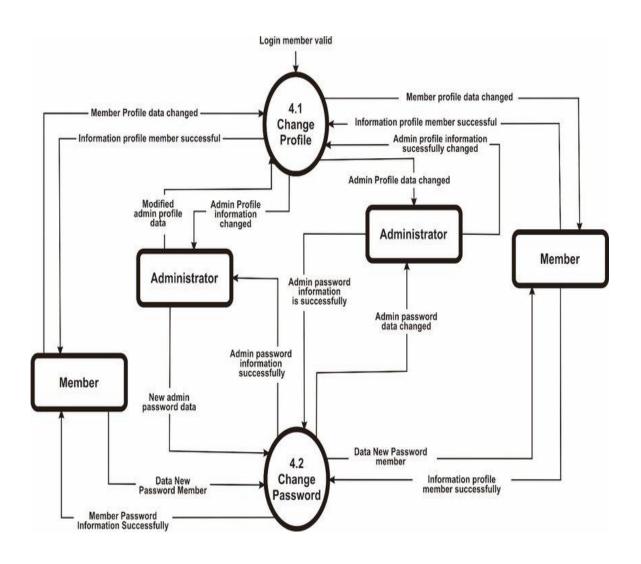


Figure 4: Level 1 DFD of Tutor Management System



4.1 System Design

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development:

• Database Design

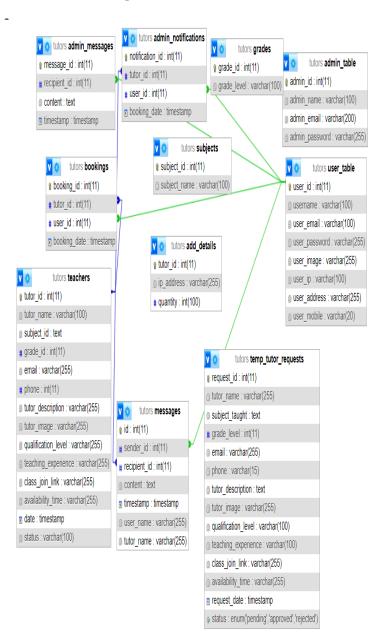


Figure 5: Database Schema Design of Tutor Management System

The design of the database is called a schema. This tells us about the structural view of the database. It gives us an overall description of the database. A database schema defines how the data is organized using the schema diagram. In the above database schema design, we have 11 tables. So, we can represent the schema of these 11 tables using the schema diagram as above.

• Forms and Report Design

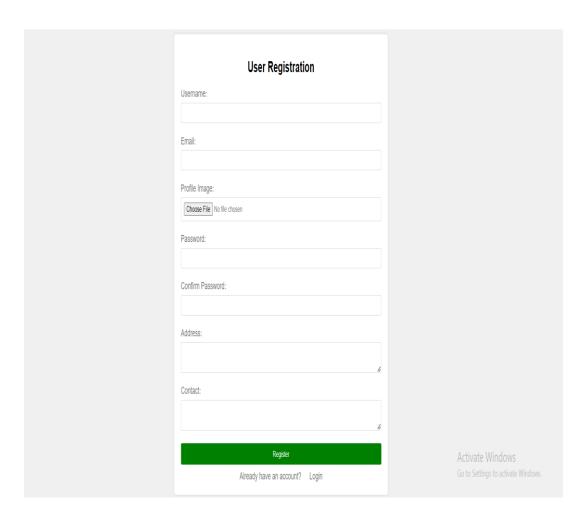


Figure 7:User Registration form

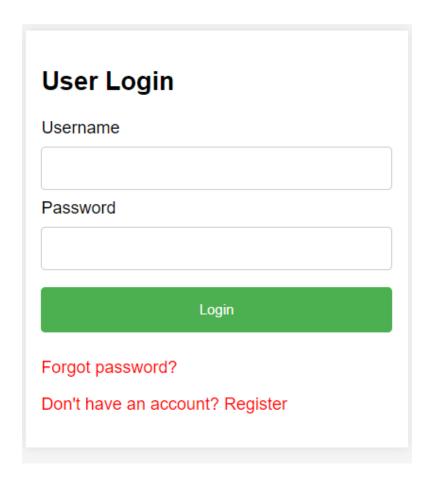


Figure 8:User Login form

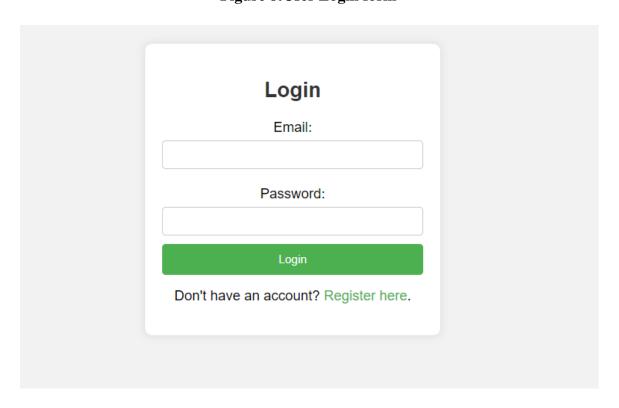


Figure 8: Admin Login form

• Interface and Dialouge Design

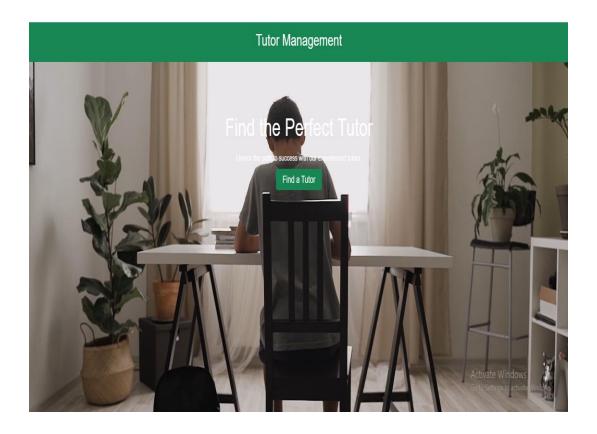


Figure 9: Home page of Tutor Management System

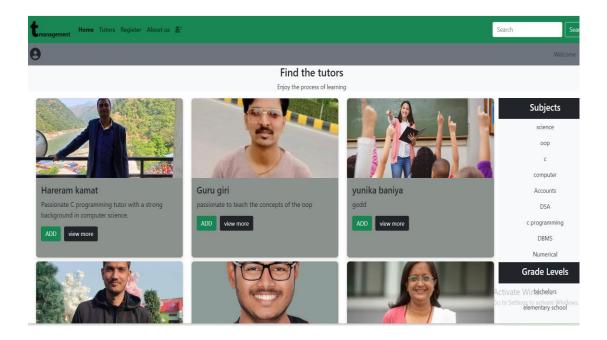


Figure 10:Tutors of Tutor Management System

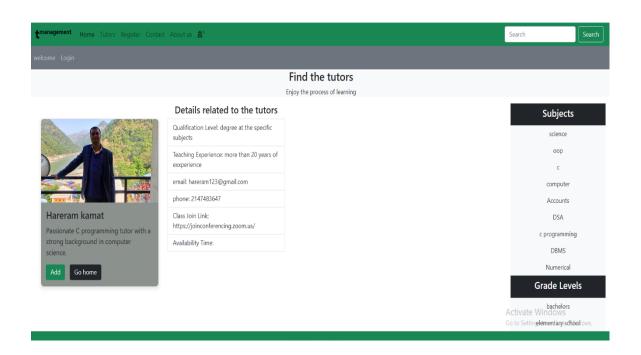


Fig 11: View more page of Tutor Management System

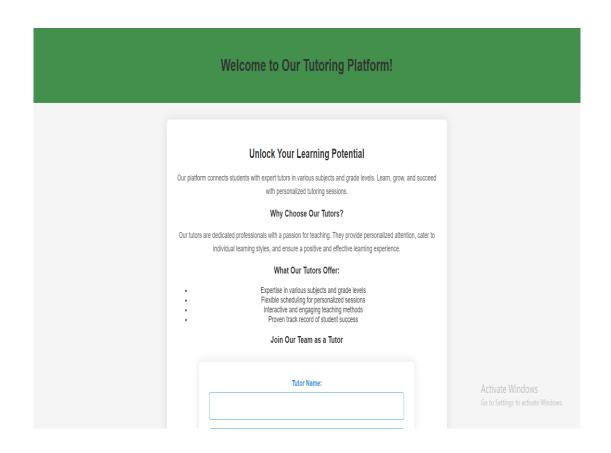


Figure 12:About us page of the Tutor Management System

4.2. Algorithm Details

The Algorithm used in this system are given below;

i. Linear Search Algorithm

For the project we are using linear search algorithm. This linear search algorithm checks each tutor name sequentially and adds names to the results list if they contain the search query. The final result is a list of tutor names that match or partially match the user's search. we can integrate this algorithm into our Tutor Management System's search functionality, adapting it to our specific programming language and data structures.

```
#include <stdio.h>
 int search(int arr[], int N, int x)
{
 for (int i = 0; i < N; i++)
     if (arr[i] == x)
        return i;
  return -1;
}
 // Driver code
int main(void)
{
  int arr[] = \{ 2, 3, 4, 10, 40 \};
  int x = 10;
  int N = sizeof(arr) / sizeof(arr[0]);
 // Function call
  int result = search(arr, N, x);
  (result == -1)
```

```
? printf("Element is not present in array")
    : printf("Element is present at index %d", result);
    return 0;
}
```

Chapter 5

Implementing and Testing Design

5.1 Implementation

5.1.1 Tools Used

FRONT END

HTML, CSS, JavaScript, and PHP are utilized to implement the frontend.

HTML5 (Hyper Text Markup Language)

HTML5 is a syntax used to format a text document on the web. It is used to create overall structure of the project.

CSS3 (Cascading Style Sheets)

CSS3 is a style sheet language used for describing the look and formatting of a document written in a markup language. It is used to give the looks to the project.

Java script V8.9.255.25

Java Script is a dynamic computer programming language. It is most commonly used as part of web browsers, whose implementations allow client-side scripts to interact with the user, control the browser, communicate asynchronously, and alter the document content that is displayed. Java Script is used to create popup windows displaying different alerts in the system like "Are you sure want to delete this user?" search functionality" etc.

PHP 7.4.11

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. It is used to dynamically display pages in the project and interact with database.

BACKEND

The back end is implemented using MySQL which is used to design the databases.

MySQL 8.0.22

MySQL is the world's second most widely used open-source relational database management system (RDBMS). The SQL phrase stands for Structured Query Language. MySQL is used to store all the data of project.

5.1.2. Implementation Details of Modules

Implementation

After the design was made and the problems arising from the design process where clarified and dealt with, it was time to start implementing the application. Implementing application of this scale requires lots of resources and explaining the whole implantation process will not be clarified in this paper. However major important aspects in the implementation will be described.

The website designs:

There are only one style Sheets for whole website. The CSS style sheets are all linked to the master pages hence there is less or no presence of inline styling. The actual implementation has been done using PHP. PHP has been used to interact with the backend database. In this implementation, My SQL Server has been used as the backend. PHP processes the inputs or commands given by the user and translates them in the commands understandable to the backend database. The output produced by the backend database is also handled by PHP which then displayed on the browser screen. Since every page will be attached to the Master Page at runtime the website has keeps a constant look and feel.

Searching:

To Search tutor on the website you have not to be a registered member. There is a search box button and textbox control in home page to get input of subject titles or search for tutors in the database. The results are will be shown in same page.

Book tutor:

To book a tutor, when we check the teacher profile there will be option to add to cart. We can add to cart at first but later if we don't want to book the teacher that we have added to our cart then we can remove it also by using the remove box button. There is a book tutor button in add to cart page from which we can book the tutor.

Register Form:

It is used in order to register the new users to the website. It contains the text field like email, username, password, confirm password. The information entered is further stored to be used in the login page.

Login Form:

It is used in order to provide the user the gateway to the website. It uses the data like username and password from register form to authenticate the user and give further access.

User Module:

It provides information related to the user. It provides information like cart detail, product detail, login, register and logout.

Admin Module:

It provides information to the admin. It provides information like tutor details, admin can add or remove tutors.

5.2. Testing

For the application or website to be deployed it has to be tested. Hence test cases will be written to test this application. They are many types of tests to be carried out on a web application from performance, functionality, database loading time, response time, server time handling, user's actions, and many others. We will not carry out all types of tests for the application considering the time scale to present this project. Hence performance check related to upload time, memory usage will be part of a future test. We will focus the test cases on functionality, security and performance.

The later test on the website will make sure that the website provides the right results and outcome. The test will help reduce unpredictability on the website. We will run test on various browsers making sure that the website produces the same result and is stable on various browsers making sure that the website produces the same result and is stable on the major popular browsers.

Finally, the last test will be the checking of all input source such as query strings, web services and textboxes. This will help prevent cross-side scripting attacks and SQL injection.

5.2.1 Test Cases for Unit Testing

Table 2 : Unit Test Case for User Register

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
U_REG_1	User forgets to enter a particular required field	Username: Komal Email: abc@gmail.com Profile Image:komal.jpg Password:333 Confirm Password:333 Address:Brt Contact:9842031832	Display message that Please fill out field	As expected	Pass
U_REG_2	User enters The Invalid Email Formats	Username: Komal Email: abc Profile Image: komal.jpg Password: 333 Confirm Password: 333 Address: Brt Contact: 9842031832	Display message that Please include an '@' in the email address.'ab c' is missing an '@'	As expected	Pass
U_REG_3	User enters different password in confirm field	Username: Komal Email:abc@gmail.co m Profile Image:komal.jpg Password:333 Confirm Password:456 Address:Brt Contact:9842031832	Password and Confirm Password do not match. Please enter the same password.	As expected	Pass
U_REG_4	User enters all the details successfully	Username:Komal Email:abc@gmail.co m Profile Image:komal.jpg Password:333 Confirm Password:456 Address:Brt Contact:9842031832	User registered successfull y	As expected	Pass

Table 3: Unit Test Case for User Login

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
U_LOG_1	Users enters a wrong email	Email:komal45@gmail.com Password:123	Display a message Login or password is incorrect	AS expected	Pass
U_LOG_2	User enters correct email and password	Email:komal@gmail.com Password:123	User login successful lly	AS expected	Pass

Table 4: Unit Test Case for Admin Login

ID	Test Case	Test Data	Expected	Actual	Pass/Fail
	Description		Result	Result	
A_LOG_1	Admin	Email:maya12@gmail.co	Display	AS	Pass
	enters a	m	message	expected	
	wrong email	Password:123	Invalid Email		
			or		
			password!!!Try		
			again!!		
A_LOG_2	Admin	Email:maya@gmail.com	Admin	AS	Pass
	enters	Password:123	login	expected	
	correct		successful		
	email and		lly		
	password				

 Table 5 :Unit Test Case for ADD, UPDATE, EDIT, DELETE

ID	Test Case Description	Test Data	Expected Result	Actual Result
AUED_T	Admin	Tutor Name:yunika	Display	AS
_1	/Tutor forgets to enter a particular required field to add the tutor	Subject: Taught: math Grade Level: Email:yunika@gmail.com Phone:9876543214 Tutor Description:exprienced Tutor Image:yunika.jpg Qualification Level: bachelor teaching Experience:5 years Class Join Link:https/joinclass.com	message please fill out this field	expect ed
AUED_T	Admin/Tut	Tutor Name: yunika	Tutor should	AS
_2	or enters	Subject Taught: math	be added in	expect
_2	correct details to add new tutor	Grade Level: elementary school Email: yunika@gmail.com Phone: 9876543214 Tutor Description: experienced Tutor Image:yunika.jpg Qualification Level: bachelor teaching Experience:5 years Class Join Link:https/joinclass.com	list	ed

AUED_T	Admin	Tutor Name: yunika	Tutor should	AS
_3	update and edit the tutor details and subjects	Subject Taught: math Grade Level: elementary school Email: yunika@gmail.com Phone: 9876543214	be updated subject and grade_level wise	expect ed
		Tutor Description: experienced Tutor Image:yunika.jpg		
AUED_T	Admin delete a	delete	Tutor should	AS
_4	tutor from		be deleted	expect ed
	list			

Table 6:Unit test case for Search tutor

ID	Test Case Description	Test Data	Expected Result	Actual Result	Pass/Fail
U_SER_1	User enter tutor name	uujwal	Display tutor details	AS expecte d	Pass
U_SER_2	User did not enter tutor name	123	No data found!!!	AS expecte d	Pass

Test Cases for System Testing

Table 7: System Testing

SN	Case	Input	Expected Output	Status
1 User provides the login credentials		Username:komal Password:123	Display home page with user logged in	Home page with User
			status	Logged in status is displayed
2	User view the Subject tutors	Tutors Selection	Display subject wise teachers	Tutors of the searched subject dispalyed

5.3 Result Analysis

After conducting unit testing, we analyze that both registration and login system is functioning correctly and there are no bugs or defects. If a test case fails, we need to investigate and fix case fails, we need to investigate and fix the issue before moving on to system testing.

Chapter 6

Conclusion and Future Recommendation

6.1. Conclusion

Our goal was to create an website where teachers will upload their information related to tutoring students and be able to tutor students online. The current website has fulfilled these goals. We followed the specifications strictly but enhanced some of the features when there was need for it to be done. With the goals achieved the basis of the website and this project has been achieved. Building this web application has been challenging and enriching because throughout the project we learnt a lot about PHP, JavaScript and understand what it takes to build a fully functional website. There have been challenges especially when it came to backend and making sure that the website responses in a predictable. Careful planning made our job easier because we had to carefully think about the type of architecture, the design, the database types to use and what type of business objects to create. When this was done, we proceeded with implementation.

Choosing the PhP for this project is because it is very simple and easy to use, compared to another scripting language, this is widely used all over the world. it is Open source; we can freely download and use. And it is Platform Independent as well.

As we came to the end of the project, we realized that there are many enhancements that can be made on the website. Some of these ideas came from those who tested the website and some of them from both of us. we decided to follow the specification because there were realistic to achieve in this given amount of time. Any other enhancements to the website can be done in future development of the application.

6.2. Future Recommendations

Here is what can be added in the future on this website to increase its usability, user experience and portability of the website. There is a lot to be done hence this website can be considered as a starting point for something big to come. It will need more time and resources for all these to be done but it is still very realistic and possible to achieve.

- Add payment gateways,
- Reservation of tutor for specific time period,

- Add forums and videos,
- Make responsive,
- Greater user experience,
- Free trial classes, etc.

References

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- [5] TeachWork. (2015). TeachWork: Gives the platform for teachers and students. TutorBird. Available: https://www.tutorbird.com [Accessed: 09-Oct-2023]

APPENDICES

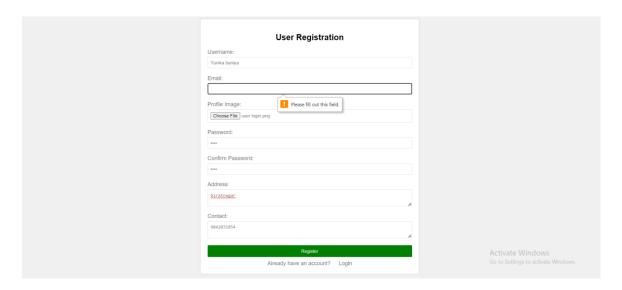


Figure 1: Register page

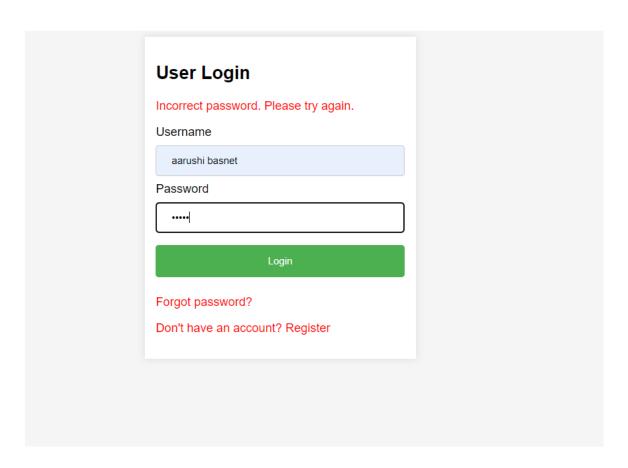


Figure 2: Login page

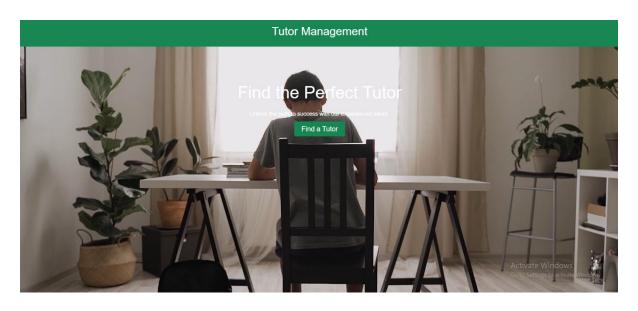


Figure 3: Home page

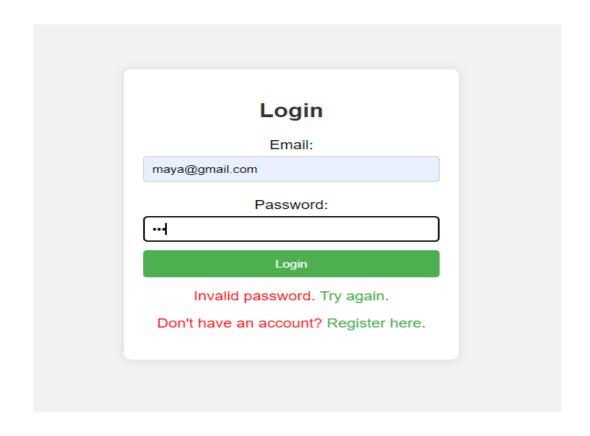


FIGURE 4: Admin login page

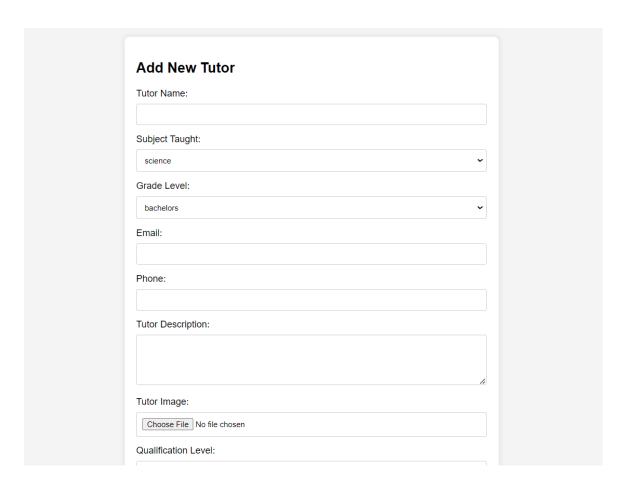


Figure 5:Add tutor page

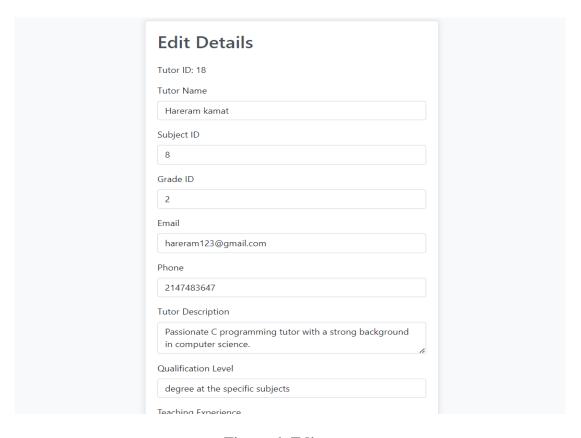


Figure 6: Edit page

Master page