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PROJECT WORK

STUDY HUB: A VIRTUAL CLASSROOM

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CERTIFICATE

This is to certify that the project entitled ***"STUDY HUB*: *A VIRTUAL CLASSROOM"*** has been done and submitted successfully by the undersigned students, as part of their University of Calcutta curriculum for the 3-year undergraduate degree course in **B.Sc. Computer Science (Hons.)**, under Prof. Abhishek Dey, presented for the 6th semester examination of the courses **CMSA-CC-6-13-Pr & CMSA-CC-6-14-Pr**, held on **1st August, 2022**. Furthermore, this is an original piece of work, and meets all the necessary criteria, to be accepted as a project work submitted for a Bachelor's degree programme in Computer Science.

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ACKNOWLEDGEMENT

Presentation inspiration and motivation have always played a key role in the success of any venture.

We take the opportunity to express profound sense of gratitude and respect to all those who helped us throughout the development of our project titled **"STUDY HUB**: **A VIRTUAL CLASSROOM"**.

We express our sincere thanks to University of Calcutta, for giving us the opportunity to work and thus explore various fields of technology to enrich our experience and learnings and Prof. Dr. Krishna Roy, Principal, Bethune College for being the pillar of strength of accomplishment of this venture.

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ABSTRACT

Education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. Online education enables the teacher and the student to set their own learning pace, and there's the added flexibility of setting a schedule that fits everyone's agenda. As a result, using an online educational platform allows for a better balance of work and studies, so there's no need to give anything up. Keeping this in mind, the project is developed to serve as a feasible platform of education for both students as well as teachers. There is option for recording the classes to facilitate the students as they can re-watch the classes whenever they want and accelerate through concepts as they choose which may help them retain better. A chat box is available for better communication between users. We have also provided the users with an upload and download section where they can upload or download documents as and when they wish to do so.

STUDY HUB

Welcome to our classroom where the magic never stops and the adventure never ends

1. INTRODUCTION:

During the outbreak of pandemic, the Education processes applied online distance learning in presenting the learning materials. Education has changed dramatically, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms. For those who do have access to the right technology, there is evidence that learning online can be more effective in a number of ways. Some research shows that on average, students retain 25-60% more material when learning online mostly due to the students being able to learn faster online; e-learning requires 40-60% less time to learn than in a traditional classroom setting because students can learn at their own pace, going back and re-reading, skipping, or accelerating through concepts as they choose.

Gone are the days where students were only given the option of studying in person, forced to waste most of their day attending just a few classes. Now, with the increasing popularity and ease of e-Learning, students no longer need to make arduous journeys to their classrooms and can instead find the model of learning that best suits them. So, we chose our domain of work for giving a feasible platform of education for both students as well as teachers. The main objective of our project is to provide a user-friendly learning platform for both student and teacher. A platform that can be easily used by both technical and non-technical persons.

2. BACKGROUND STUDY:

There are a few existing systems like Google meet, Skype etc. which enables the world's conversations. Design of Skype resembles our system to a great extent, with almost similar types of parameters and criterions and filtering. There is also Google classroom used for Uploading and downloading documents.

In spite of existing such systems our motivation is to select such a field to explore as our project topic in order to make the process easier and approachable for every student and teacher. Additionally, the thing which makes our web application quite unique from the existing systems is that we have tried to incorporate both video calling and document upload and download into one system only. We studied and took references from various blogs and videos for designing the portion of video conferencing, uploading and downloading documents and also for the front-end design (the references are given in the **References** section).

3. PROPOSED DESIGN & METHODOLOGY:

3.1. Requirement Analysis:

The main purpose of the requirement analysis activity is to analyse the collected information to obtain a clear understanding of the product or software to be developed, with a view of removing all the ambiguities, incompleteness and inconsistencies from the perception of the problem definition.

3.2. Functional Requirements:

Our system has the following functionalities-

a) Input: Teacher can start a new meeting by entering the user id and by using that user id a student can enter the meeting.

b) Upload: In the upload section teacher can upload study materials, news and announcements and give assignments to the students and students can upload there completed assignments.

c) Hardware Requirements: A minimum of 2GB RAM, 500 GB HDD space, 1.2 GHZ or more capable processor and a good internet connection with speed 1 mbps or higher is recommended for smooth running of the application.

d) Software Requirements:

Any internet browser (Mozilla, Chrome, Internet Explorer), Database server (like XAMPP, WAMP or LAMP) for creating the database (PHP MyAdmin for creating the relational schema and their entries), any coding environment or IDE which can support languages like HTML, CSS, JavaScript to design the user interface and PHP and SQL for constructing queries and connecting databases with the front-end website.

3.3. Non-functional requirements:

a) Maintainability: The website needs to be visited in a regular interval to constantly update the system with new features.

b) Portability: We have not connected the website using an online domain system that is why the portability has become a major issue for this system which makes it non-portable over the internet and need to store the data manually which is discussed later in the limitations section.

c) Usability: The usability of the system is quite good as the system becomes usable for every user who even do not have access over the internet provided the necessary databases and the front-end connectivity has been established at their end.

3.4. ENTITY-RELATIONSHIP (ER) DIAGRAM OF THE SYSTEM:

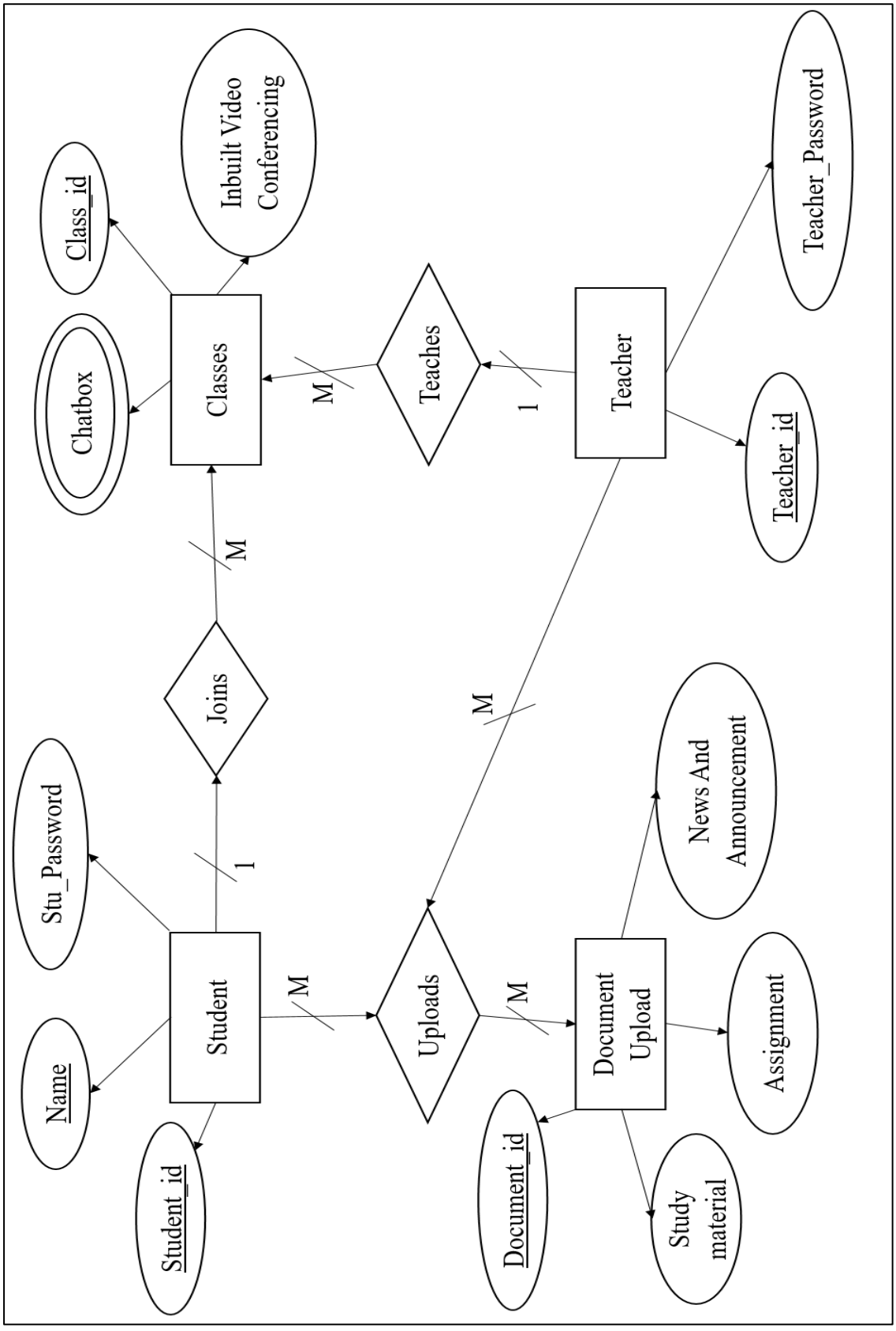


Fig. 1

EXPLANATION OF ER-DIAGRAM:

1. Entity Identification

We have four entities:

1. Student

2. Classes

3. Teacher

4. Document Upload

2. Relationship Identification

We have the following four relationship:

1. The student joins classes.

2. The teacher teaches classes.

3. Teacher uploads document.

4. Student uploads document.

3. Cardinality Identification

For them problem statement we know that,

1. A student can join multiple classes.

2. A teacher can teach multiple classes.

3. Multiple teacher can upload multiple documents.

4. Multiple student can upload multiple documents.

4. Identify Attributes

Once the mapping is done , we need to identify the Entity, Primary Key , Attributes , Multi-valued Attributes.

Entity	**Primary Key**	**Attributes**	**Multi-Valued Attributes**
Student	Name, Student_id.	Student_id, Name, Stu_Password	
Classes	Class_id	Inbuilt Video Conferencing	Chatbox
Teacher	Teacher_id	Teacher_id, Teacher_Password	
Document Upload	Document_id	Study material, Assignment, News and Announcement	

3.5. DATA FLOW DIAGRAM OF THE SYSTEM:

LEVEL-0 DFD (CONTEXT DIAGRAM):

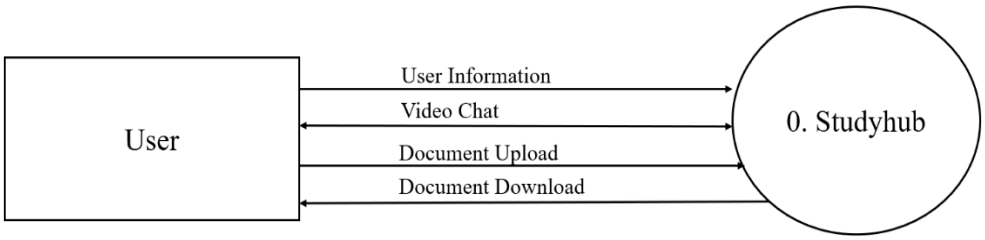


Fig. 2

LEVEL 1 DFD:

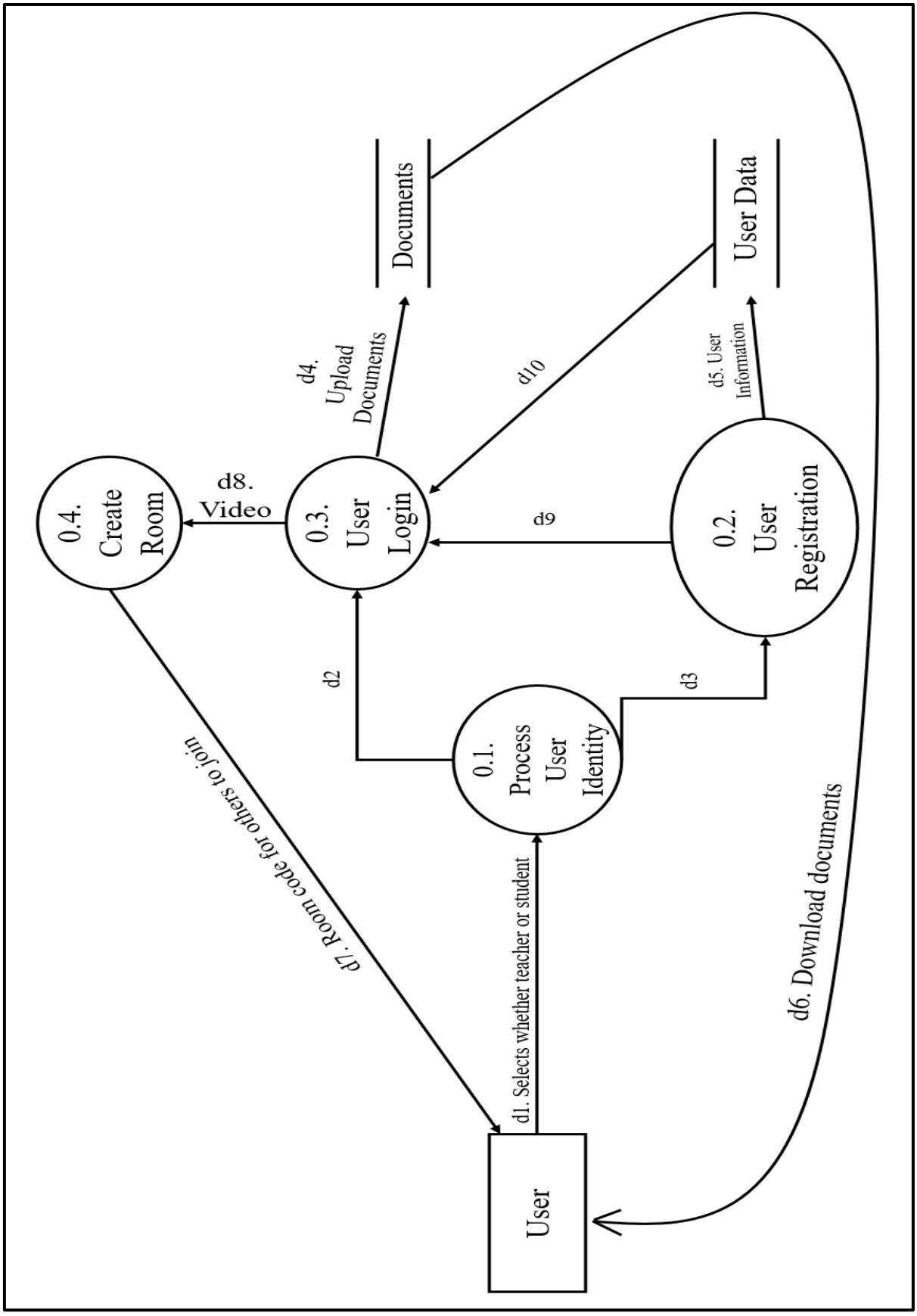


Fig. 3

LEVEL 2 DFD:

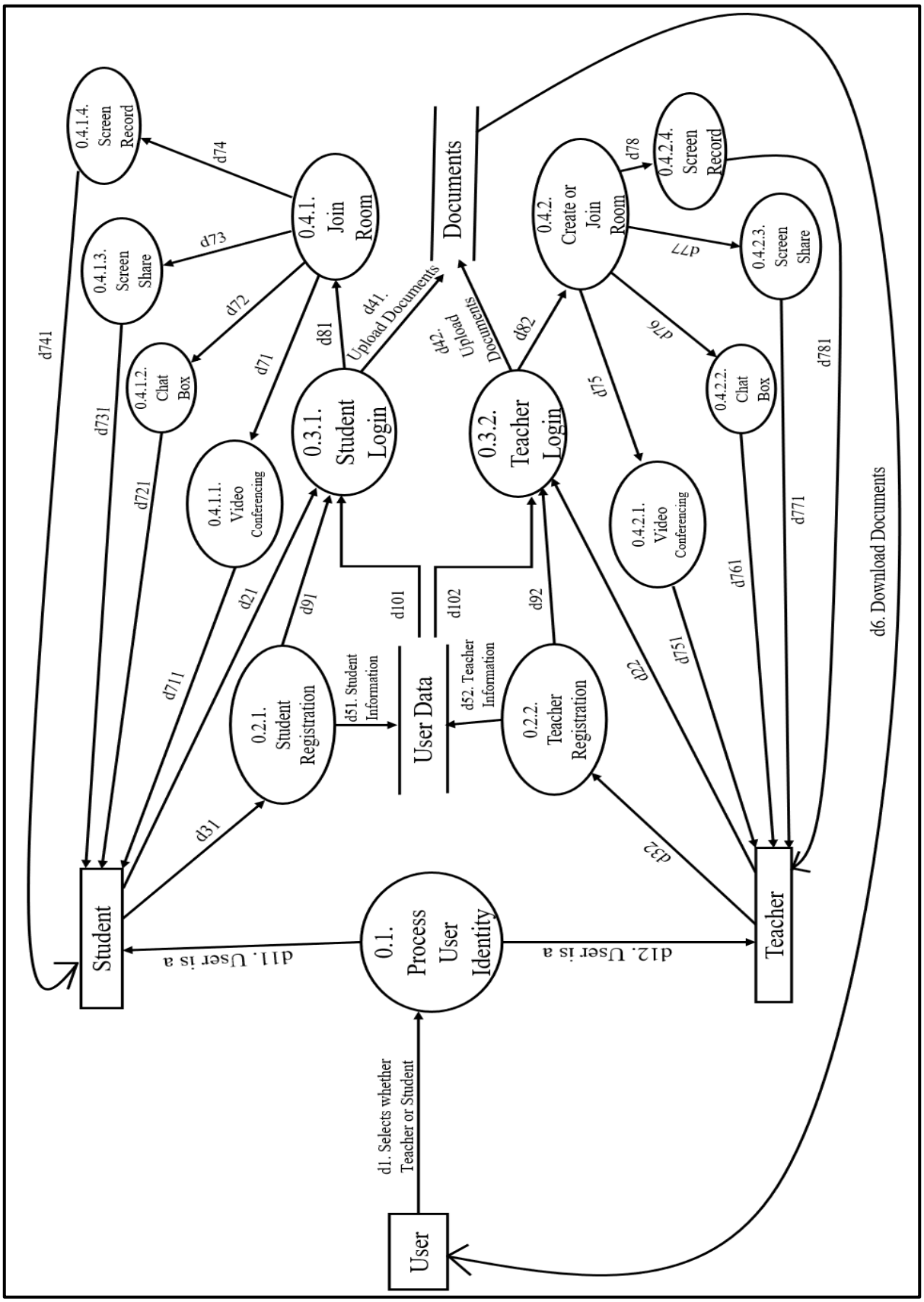


Fig. 4

EXPLANATION OF DATA-FLOW DIAGRAM:

In the **context diagram**, the entire webapp has been treated as a single process and is represented by the bubble 0. The data items (User information, video chat, document upload and document download) flow in and out from the user entity to the bubble 0.

At level 1 DFD:

1. The bubble 0 has been decomposed and it's children are numbered as 0.1, 0.2 , 0.3 and 0.4.
2. In this level data item d1 flows into the bubble 0.1 and data items d3 and d2 flow out of 0.1.
3. Data item d3 flows into bubble 0.2 and data item d5 flows out from 0.2 into the data store "User Data". Data item d9 flows out from 0.2 into the bubble 0.3.
4. Data item d2 flows into bubble 0.3 and data item d4 flows out from 0.3 into the data store "Documents". Data item d8 flows out from 0.3 into the bubble 0.4.
5. Data item d8 flows into bubble 0.4 and data item d7 flows out from 0.4 into the User entity.

At level 2 DFD:

1. The bubble 0.2 is decomposed into 2 DFDs (0.2.1 and 0.2.2). The data item d31 flows into the bubble 0.2.1 from the entity student and data item d51 flows out from 0.2.1 into the data store "User Data". The data item d32 flows into the bubble 0.2.2 from the entity teacher and data item d52 flows out from 0.2.2 into the data store "User Data".

2. The bubble 0.3 is decomposed into 2 DFDs (0.3.1 and 0.3.2). The data items d21, d91 and d101 flow into the bubble 0.3.1 and data items d41 and d81 flow out from 0.3.1. The data items d22 , d92 and d102 flow into the bubble 0.3.2 and data item d42 and d82 flow out from 0.3.2.

3. The bubble 0.4 is decomposed into 2 DFDs (0.4.1 and 0.4.2). The data item d81 flows into the bubble 0.4.1 and data items d71, d72, d73 and d74 flow out from 0.4.1. The data item d82 flows into the bubble 0.3.2 and data item d42 and d82 flow out from 0.3.2.

    a) The bubble 0.4.1 is further decomposed into 4 DFDs (0.4.1.1, 0.4.1.2, 0.4.1.3 and 0.4.1.4). The data item d71 flows into the bubble 0.4.1.1 and data item d711 flows out from 0.4.1.1. The data item d72 flows into the bubble 0.4.1.2 and data item d721 flows out from 0.4.1.2. The data item d73 flows into the bubble 0.4.1.3 and data item d731 flows out from 0.4.1.3. Finally, the data item d74 flows into the bubble 0.4.1.4 and data item d741 flows out from 0.4.1.4.

    b) The bubble 0.4.2 is further decomposed into 4 DFDs (0.4.2.1, 0.4.2.2, 0.4.2.3 and 0.4.2.4). The data item d75 flows into the bubble 0.4.2.1 and data item d751 flows out from 0.4.2.1. The data item d76 flows into the bubble 0.4.2.2 and data item d761 flows out from 0.4.2.2. The data item d77 flows into the bubble 0.4.2.3 and data item d771 flows out from 0.4.2.3. Finally, the data item d78 flows into the bubble 0.4.2.4 and data item d781 flows out from 0.4.2.4.

3.6. Algorithmic Approach:

Step 1: Start

Step 2: At first the home page of the website "STUDY HUB" appears to the user.

Step 3: Perform the steps 4-6 until user closes the application.

Step 4: The User comes up with the option whether the user is a student or a teacher.

Step 5: After this the user will come up with the following cases and choose any one of them according to their preference-

Case A: If user is already a member then they will sign in.

Case B: If user is not a member then they need to sign up or register themselves.

Step 6: After sign in or sign up the user is directed to their personal accounts where they will come up with the following cases and choose any one of them according to their preference-

Case A: User selects Video option

Then

Calling procedure Video

Case B: User selects Upload option

Then

Calling procedure Upload

Case C: User selects Download option

Then

Calling procedure Download

Case D: The user selects Logout option and exits from the account

Step 7: Stop

Procedure Video

Begin

Step 1: Checks whether the user is a student or a teacher.

Step 2: If the user is a teacher

Then

Option for starting a meeting or joining a meeting is displayed

Else If the user is a student

Then

Student has to enter a joining code to join a meeting

End if

Step 3: The number of participants present in a meeting will be shown at the top right of the meeting window

Step 4: If any user after joining the meeting wants to chat

Then

Call procedure Chat.

End if

Step 5: If any user after joining the meeting wants to share their screen

Then

Call procedure Screenshare.

End if

Step 6: If any user after joining the meeting wants to record the screen

Then

Call procedure Screenrecord.

End if

Step 7: A user can turn their webcam on and off by clicking on the video option present at the bottom of the meeting window.

Step 8: A user can turn their microphone on and off by clicking on the audio option present at the bottom of the meeting window.

Step 9: If a user wants to leave their meeting, they can do so by clicking on the exit option present at the bottom of the meeting window.

End of procedure

Procedure Upload

Begin

Step 1: User selects the required file from their device and upload that file

End of procedure

Procedure Download

Begin

Step 1: User selects the required file from the list of files to be downloaded and downloads the file

End of procedure

Procedure Chat

Begin

Step 1: User selects the chat button on the top right hand side inside the meeting window and a chat box is displayed.

Step 2: User can communicate with the other users present in the meeting by sending and reading messages in the chat box.

End of procedure

Procedure Screenshare

Begin

Step 1: User selects the Present Now button on the bottom right hand side inside the meeting window and options for selecting which portion of the screen has to be shared is displayed (Entire Screen, Window or Chrome Tab).

Step 2: User then selects one of the given options to share their screen.

End of procedure

Procedure Screenrecord

Begin

Step 1: User selects the Start Recording button on the bottom right hand side inside the meeting window and options for selecting which portion of the screen has to be recorded is displayed (Entire Screen, Window or Chrome Tab).

Step 2: User then selects one of the given options to start recording their screen.

Step 3: After the screen has been recorded for the desired time, the user has to select the stop Recording option to stop recording the screen.

Step 4: A box will be displayed where the user has to give a name by which the recorded video will be saved and the video will then be saved in the user's default folder.

End of procedure

4. IMPLEMENTATION

Creating the database:

As our project is solely based on the relational database so the tables consisting of information about the user which makes the relational schema as the basic building block of our project. The databases are made using Xampp server and the tables are created using phpMyAdmin. Our database can be broadly classified into two sub sections-

- The relational schema designed to store the information about all the uploaded documents. The table **file** inside database **upload** consists of the following attributes-

1) Id (The unique identification of the serial no. of a document)
2) file_name (The name of the file uploaded)
3) type (The type of the file uploaded eg. jpeg, pdf etc)
4) size (The size of the file uploaded in KB)

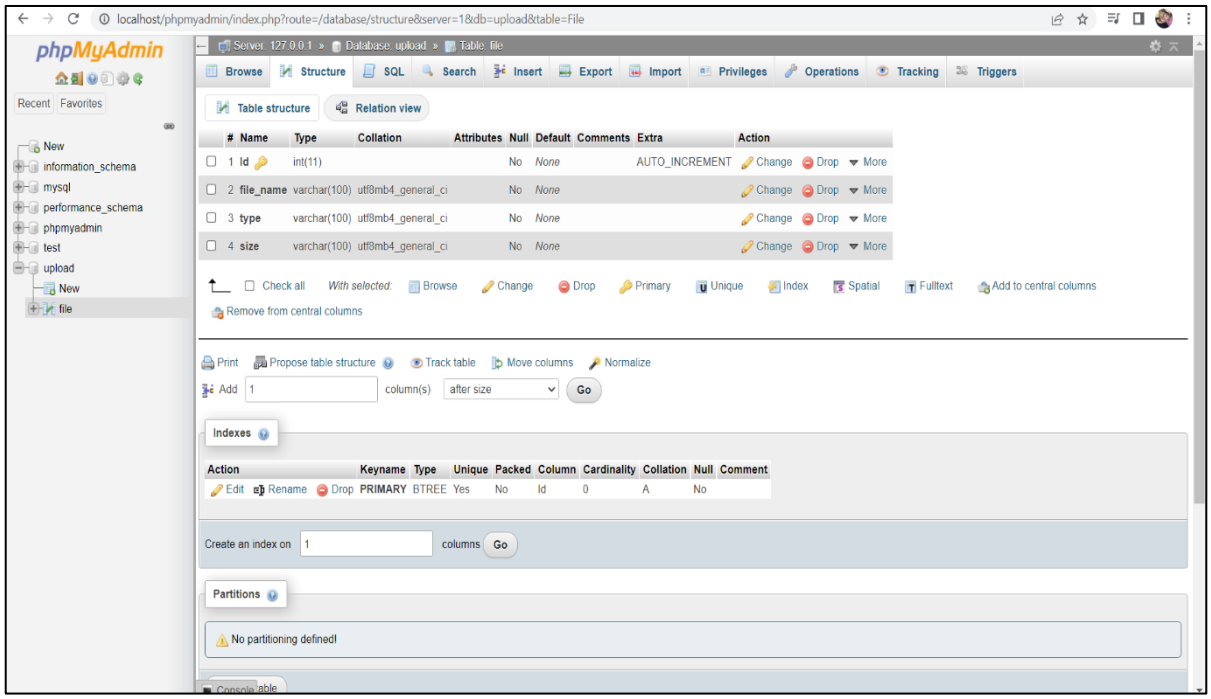


Fig. 5

- The relational schema designed to store the information about all the teachers and students registering into the webapp. It consists of two tables:

  The table **student** inside database **projectstudent** consist of the following attributes-
  1) studentid (The unique identification of the serial no. of a student)
  2) username (The name of the student registering)
  3) email (The email of the student registering)
  4) password (The encrypted password of the student registering)

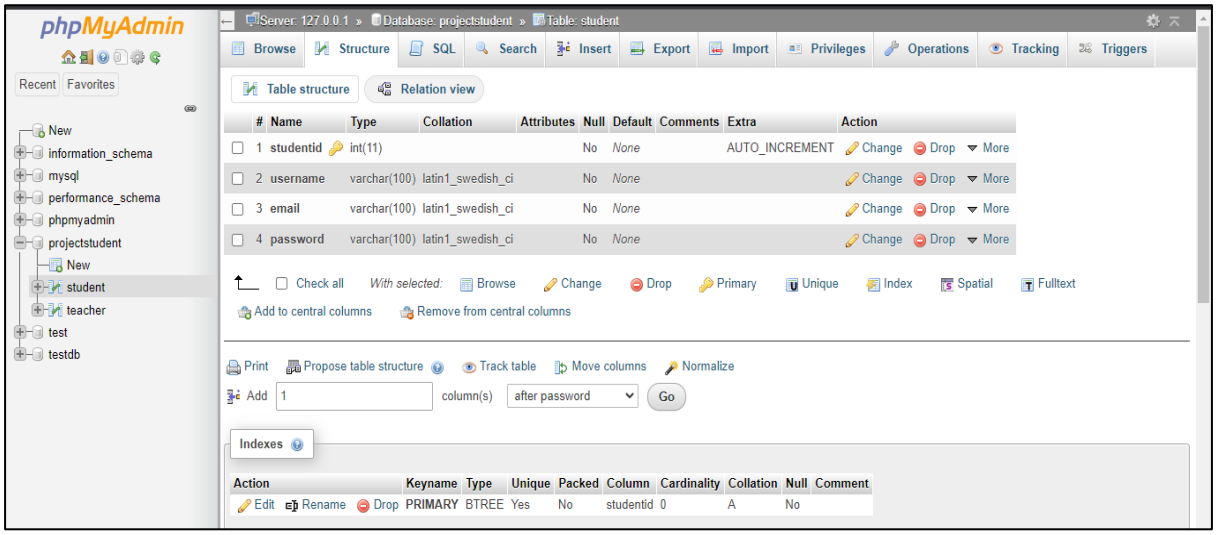


Fig. 6

The table **teacher** inside database **projectstudent** consist of the following attributes-
1) teacherid (The unique identification of the serial no. of a teacher)
2) username (The name of the teacher registering)
3) email (The email of the teacher registering)
4) password (The encrypted password of the teacher registering)

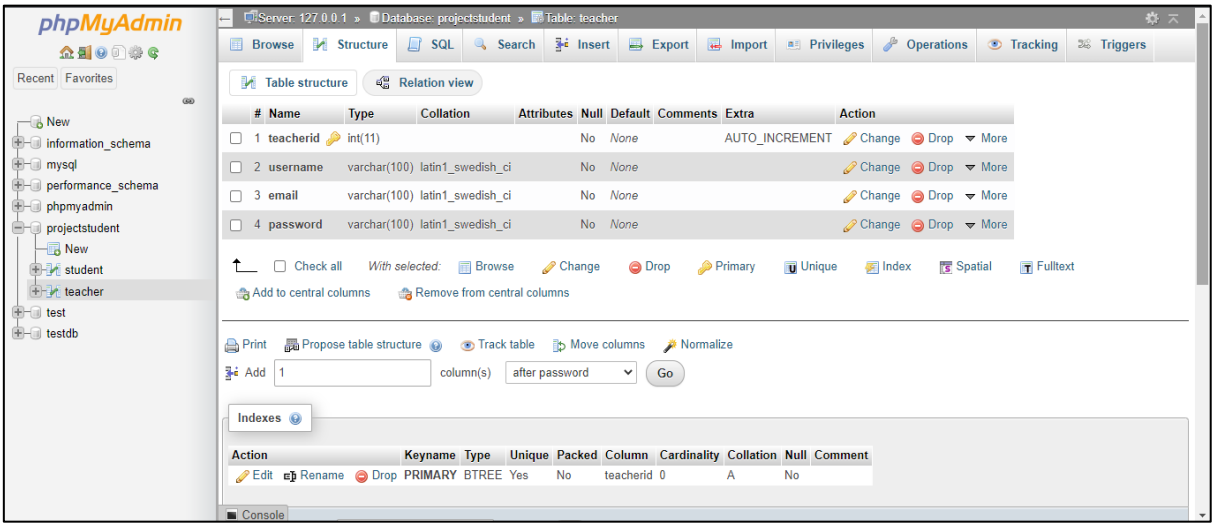


Fig. 7

4.1. Creation of the UI (User Interface):

The User Interface or the UI consist of seven webpages and seven pages of CSS coding which supports the web pages to display and function properly. The sub-section of our web sites are individual modules those are created using this HTML, CSS. HTML helps to create the display of webpages and CSS helps to control each tag of HTML and further fine tunes it according to pixel values, size, height, width, positions etc. The modules of the UI are as follows-

►**Home Page:** This tab is the introductory page of our website that welcomes the user. This page is made using various tags of HTML along with a CSS file linked with the main html page. In this page the user comes up with the option whether the user is a student or a teacher. If the user is a student then they will be directed as student in the next upcoming pages and as well as for the teachers.

►**Create Account/Registration Page:** When the user enters in this page there are two options for them:

1)If the user is already a member then they have to just sign in and they will be directed to sign in page next.

2)If the user is a new member then they have to first register themselves. To register first they have to give their user name, email id and password.

►**Sign in page:** Here the member have to sign them up to enter their user account. Here they have to give their signed username and password so that the can enter to their personal details page.

►**User account:** After the login and registration part the user will get into their respective user account. Now in this user account page there are four main parts: video, upload, download and logout. This page is for every users personal account page. Now the three main parts are the following:

1) Video: Now while clicking on video the join meeting page will appear to the user. Here also 2 cases arises:

> First if the user is a teacher then they have the option to start the meeting by entering some joining code.

> Second if the user is a student then they could only join the meeting by the code that is provided from the teacher.

After joining the meeting the main video conferencing page appears. Here the user could see each other by turning their webcam on. They can also talk to each other by unmuting their microphone.

User can also communicate with each other via the **chatbox**. Here every user can chat with each other like for example: Students can share their problems with the teacher. Also they can communicate with other students via text message through the chat box.

In this page total no of participants are also shown ie, the total headcounts will be there those who have joined the meeting.

Screenshare option is also there using which teacher can share their screen for teaching. Also the student can share their screen in case of presentation etc.

The students or teachers can also record the screen and save it for later use.

2) Upload: Here in the upload section the teacher could upload notice i.e, news and announcements, study material, Assignments for the students and the students can also upload their assignments after completing them. In the upload section when the user will click on the upload button they have to choose the file location where they have stored the particular file. If multiple documents are uploaded then also every document will be shown.

3) Download: In the download section all the documents uploaded by the teachers or students will be available. The teachers can download the assignments or any other documents uploaded by the students for correction purposes. The students can also download question papers or notices uploaded by the teachers for later use.

4) Logout: Now on clicking logout the user will return to their home page. When the meeting will be end and the user's personal tasks will be complete they can log out to stay safe.

4.2. Connection between front end and back end:

⇨ The errors within the modules are maintained using the '**errors.php**' file. The PHP file is included in all the PHP files that are linked with one another to create a successful connection. An error in establishing the connection returns the error to the error handling section.

⇨ The '**style.css**' file maintains the style of the entire webpage.

⇨ The '**server1.php**' file is connected with:

- '**register1.php**' (It takes input from the user whether the user is a student or teacher)
- '**register.php**' (The user is send to this section if the user is a student.)
- '**registerteacher.php**' (The user is send to this section if the user is a teacher.)

⇨ The '**register.php**' file is further connected with:

- '**server.php**' It takes the input from the register.php file and insert it into the databse as:

```
"INSERT INTO student (username, email, password)
 VALUES('$username', '$email', '$password')"
```

- '**login.php**'(If the user is already registered , it can move to the login page).

⇨ The '**registerteacher.php**' file is further connected with:

- '**serverteacher.php**' (It takes the input from the register.php file and insert it into the databse:

  ```
  "INSERT INTO teacher (username, email, password)
   VALUES('$username', '$email', '$password')"
  ```

- '**loginteacher.php**'(If the user is already registered , it can move to the login page).

⇨ The '**server.php**' file extracts the user name and password from the database to check for correctness

"SELECT * FROM student WHERE username='$username' AND password='$password'"

And it is connected with:

- **'index.php'** (This file contains the homepage for the student)

⇨ The **'serverteacher.php'** file extracts the user name and password from the database to check for correctness

"SELECT * FROM teacher WHERE username='$username' AND password='$password'"

And it is connected with:

- **'indexteacher.php'** (This file contains the homepage for the teacher)

⇨ The home page PHP file, **'indexteacher.php'**,for the teacher is connected with the files:

- **'action.html'** (Containing the section where the teacher can create or join the meeting room.)
- **'upload.php'** (Containing the section where the teacher can upload their documents)
- **'download.php'** (Containing the section from where the teacher can download the documents uploaded by the student.)
- **'loginteacher.php'** (Containing the section where the teacher can enter the homepage by entering their respective userid and password.)

⇨ The home page PHP file, **'index.php'**,for the student is connected with the files:

- **'actionstudent.html'** (Containing the section where the student can join the meeting room created by the teacher.)
- **'upload.php'** (Containing the section where the student can upload their projects)
- **'download.php'** (Containing the section from where the student can download the documents uploaded by the teacher.)
- **'login.php'** (Containing the section where the student can enter the homepage by entering their respective userid and password.)

⇨ The **'action.html'** file is connected with:

- **'jquery-3.4.1.min.js'** file (It collects the roomid for the room created)
- **'index.html'** file (It contains the meeting user interface)

⇨ The **'actionstudent.html'** file is connected with:

- **'jquery-3.4.1.min.js'** file (It collects the roomid for the room created by the teacher)

- **'index.html'** file (It contains the meeting user interface)

⇨ The **'index.html'** file is further connected with:

- **'app.js'** file (It contains the code for various video calling features)

⇨ The **'app.js'** file is further connected with:

- **'server.js'** file (It contains the express library that creates a client server. The server is then run on port 3000).

⇨ The **'upload.php'** file inserts file into database and stores the uploaded file in a specified folder. This file is connected with:

- **'index.html'** file (Contains the section where the user can choose the file to be uploaded)
- **'script.js'** file (Contains the part which performs the uploading operation)

⇨ The **'index.php'** file contains the tabular details of the files that can be downloaded . This file is connected with:

- **'filesLogic.php'** file (Fetches the file to be downloaded from the database)

⇨ For the login purpose, the login php files '**server.php**' and '**serverteacher.php**' is connected to '**login.php**' and '**loginteacher.php**' files respectively which helps to log in to the account created for the user by selecting the login details (Email id and Password) entered, from the table 'student' or 'teacher' in the database with the help of the SELECT query. Here the condition was to check for the user who has the same email id as entered in the login page. When the login is successful, the file again refreshes the page and the term 'Login/Register' changes to 'Logout'. If the details do not match to the ones in the table, then an error message is shown through the **'error.php'** file.

⇨ For the registration purpose, the registration php files '**server.php**' and **'serverteacher.php'** is connected to the '**register.php**' and '**registerteacher.php**' file which helps in registering a new user thus creating an account using the INSERT query. Before entering the data to the database the SELECT query checks whether a user with the same email id is already present in the database. If the query satisfies then an error message is shown, otherwise a success message is displayed on the screen.

⇨ In both the login and registration pages an empty field raises an error thus printing an error message mentioning the same through '**error.php**' file.

⇨ Once a user is logged in to the system, the session under his/her name is started, thus helping him/her to enter the homepage and to select either 'Video' for creating or joining a meeting room or 'Upload', 'Download' for uploading or downloading files.

⇨ To log out from the system, the user clicks the 'Logout' option on the page which runs the '**server.php**' or '**serverteacher.php**' file in the back end. This file unsets the 'USER_LOGIN', 'USER _EMAIL' and 'USER_NAME' from the session, thus making it ready for a new log in. As the user logs out 'Logout' option changes to 'Login/Register'.

5. RESULT:

Our project serves its desired purpose by providing an interactive environment for teachers and students. Over the past year, video conferencing has become essential for teaching, learning and staying connected. “Study Hub” provides an easy and reliable way for our teaching community to connect. Additionally, it also provides with the feature of uploading any documents or files by both students and teachers. Now, user can get their desired results as follows-

- On entering into our website, the user must specify first whether the user is a student or a teacher. The user can enter into our website with the help of any web browser along with the local host followed by the name of the page which is shown below-

localhost/register1.php

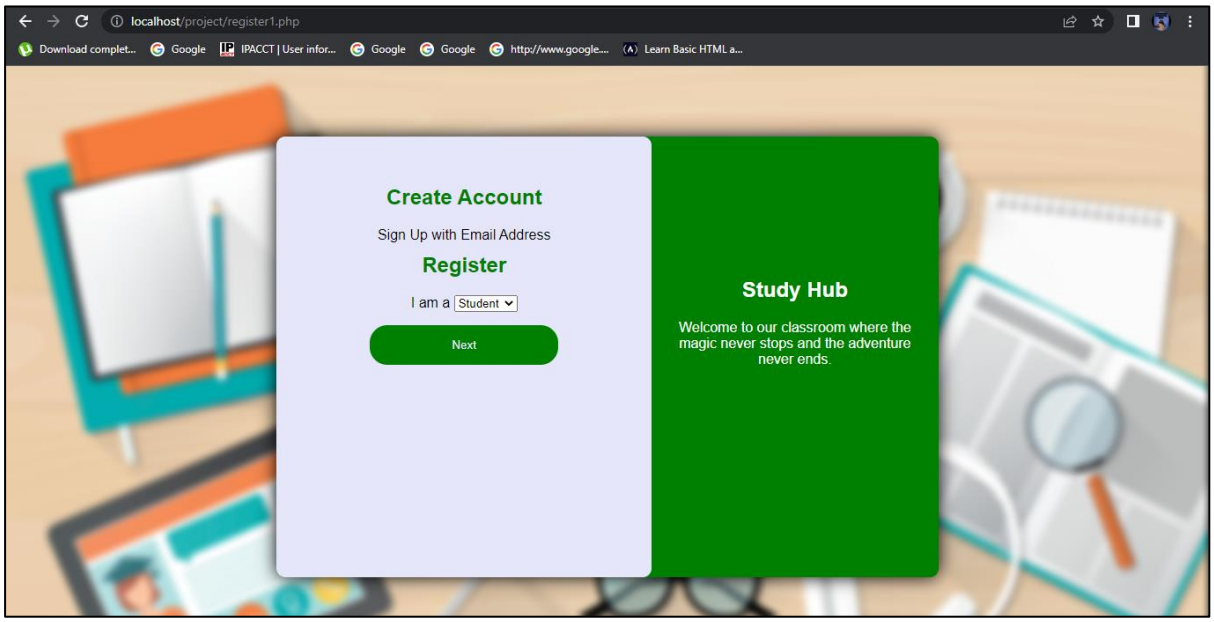


Fig. 8

After the user selects whether he/she is a student or a teacher from the drop-down menu, The user will be redirected to the registration page.

- In the registration page the user will fill up their details for registering or creating an account in our website.

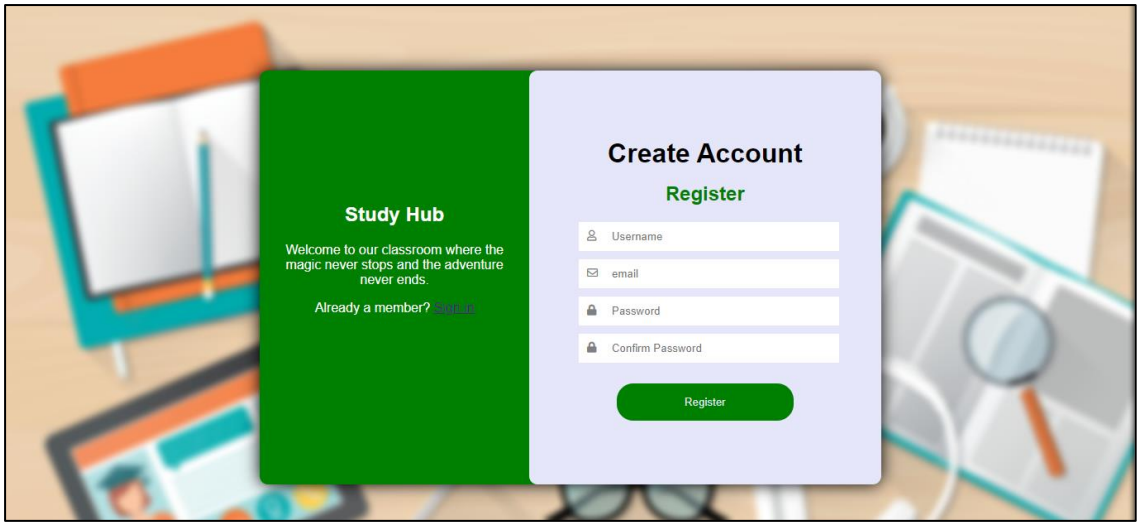


Fig. 9

If the user is already registered, they can click on the 'sign in button' present on the left-hand side of the registration page. The user will then be redirected to the login page.

- In the login page, the user can give their user name and password for login into their homepage.

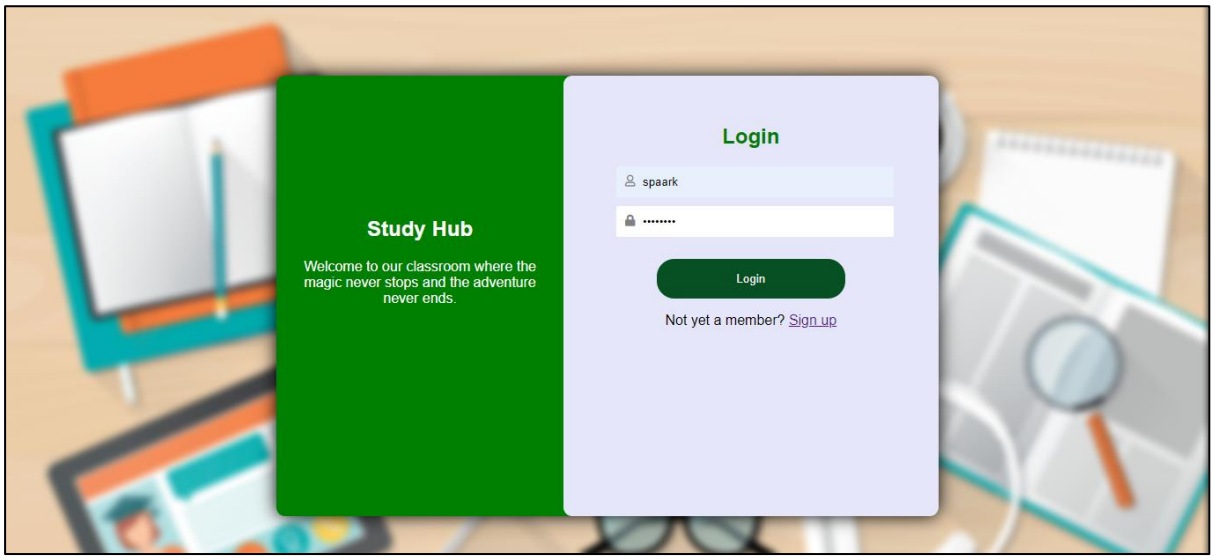


Fig. 10

The user can also visit the registration page from the login page by clicking on the 'sign up' button present on the login page.

- In the Home Page, the user can see their username along with their details . Home page of every user will contain 3 main buttons. They are:

  - Video
  - Upload
  - Download

By clicking on these buttons, a user will be redirected to the respective pages.

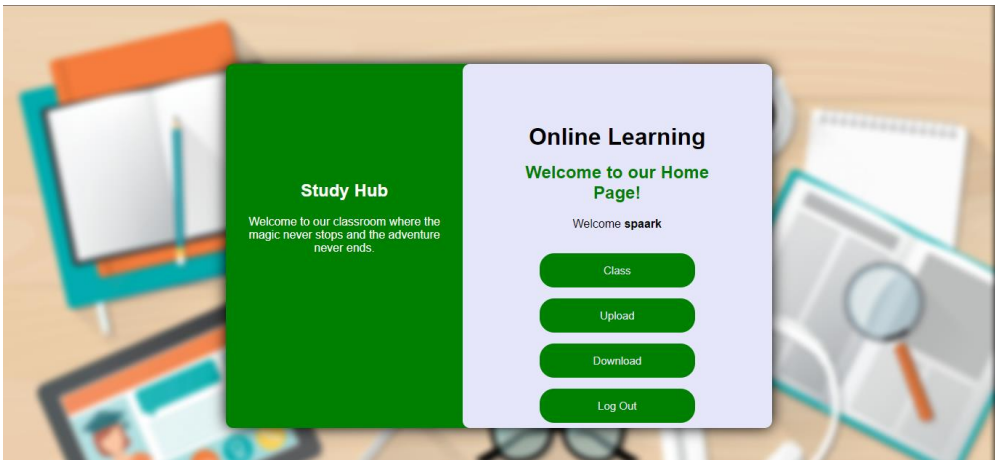


Fig. 11

The user can also log out from their account by clicking on the 'log out' button. The user will then be redirected to the login page.

- On clicking the video option, if the user is a teacher, he/she will be redirected to a page where they can create a meeting using the 'create meeting' option. They can also join a meeting by entering the code and clicking on the 'Join' option.

  On clicking the video option, if the user is a student, he/she will be redirected to a page where they can only join a meeting by entering the code (provided by their teacher) and clicking on the 'Join' option.

Fig. 12

The user will be redirected to the video conferencing page.

- In the video conferencing page, the user will have to enter their username first in a pop-up box. The user can then communicate with each other over video calls. They can also chat with each other using the chat box. The user can share their screen and can also record their screen for re-watching later. The video conferencing page will also give us a list of total participants present in the video conference.

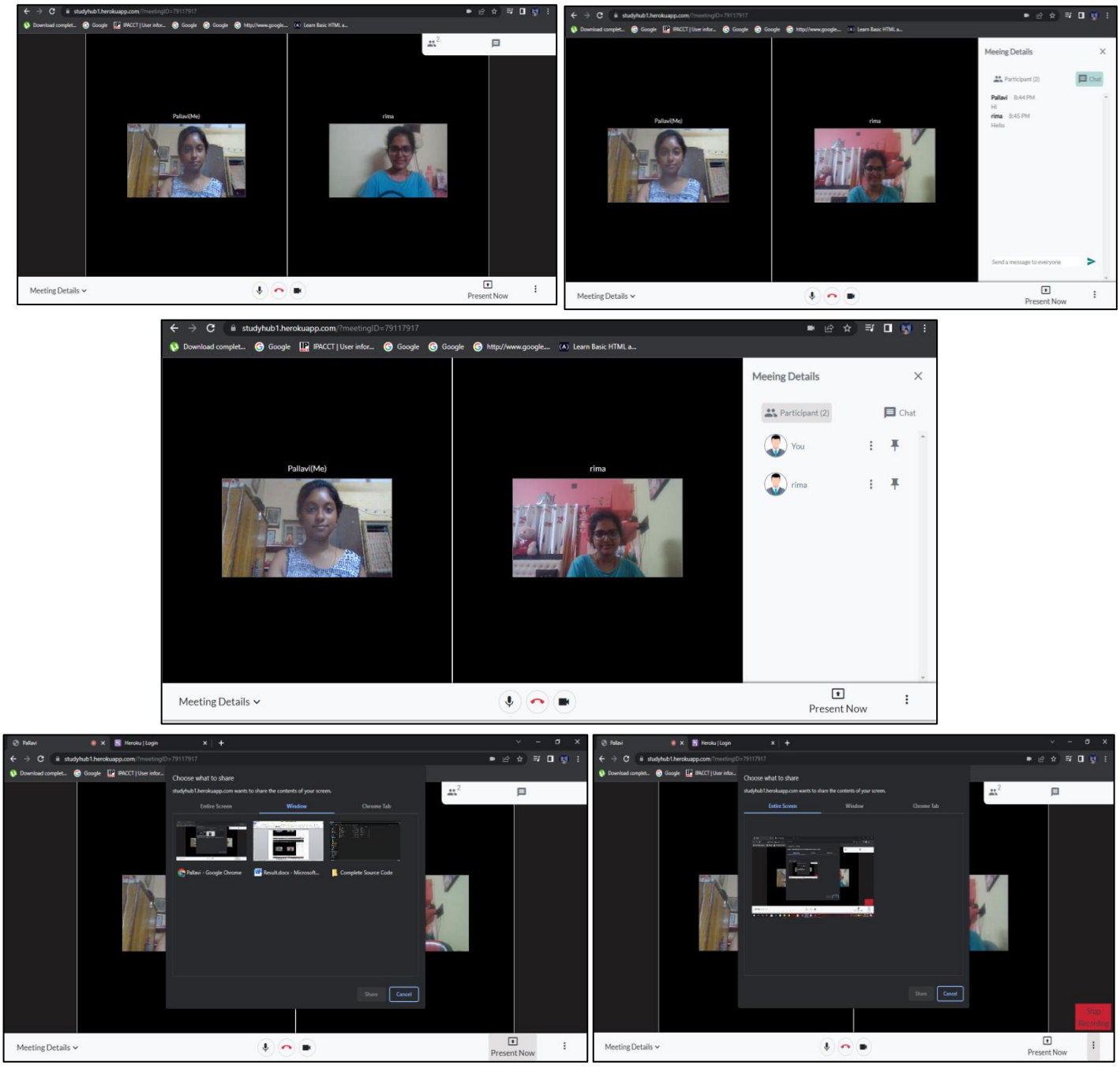


Fig. 13

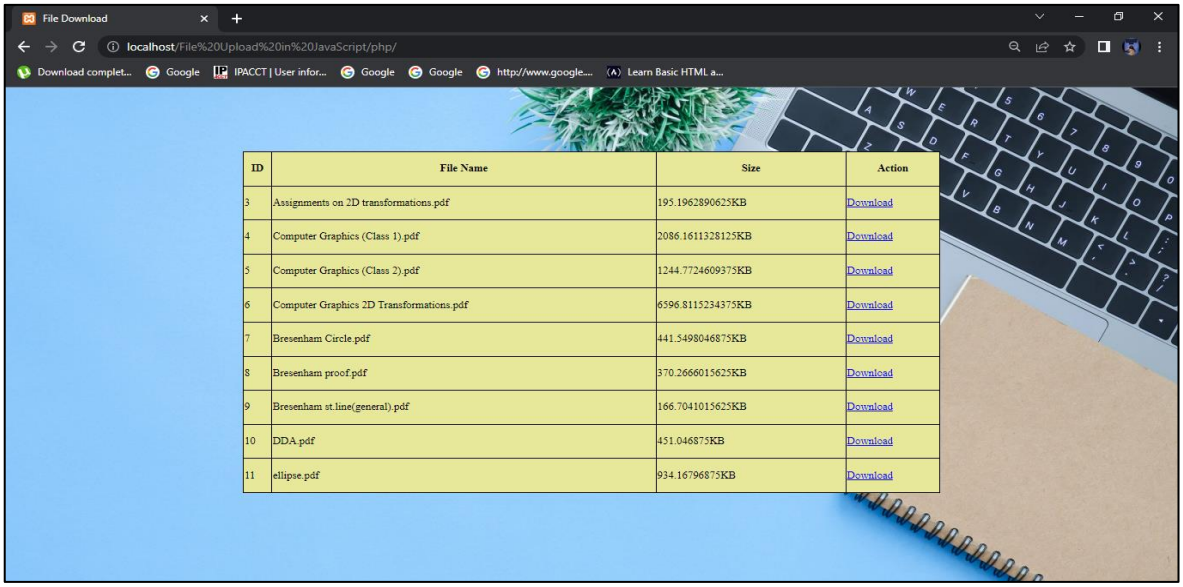
In order to leave the call the user will have to click on the end call button and the user will then be redirected to a page from where they can logout of their account.

- On clicking the upload option, the user will be redirected to the upload page where they can upload any kind of necessary files or documents.

Fig. 14

These uploaded files can be downloaded by anybody in the download section.

- In the download section, the user can download all the files that has been uploaded by the students or teachers. It contains a list that mentions the name of all the uploaded files along with their size.



ID	File Name	Size	Action
3	Assignments on 2D transformations.pdf	195.1962890625KB	Download
4	Computer Graphics (Class 1).pdf	2086.1611328125KB	Download
5	Computer Graphics (Class 2).pdf	1244.7724609375KB	Download
6	Computer Graphics 2D Transformations.pdf	6596.8115234375KB	Download
7	Bresenham Circle.pdf	441.5498046875KB	Download
8	Bresenham proof.pdf	370.2666015625KB	Download
9	Bresenham st.line(general).pdf	166.7041015625KB	Download
10	DDA.pdf	451.046875KB	Download
11	ellipse.pdf	934.16796875KB	Download

Fig. 15

6. CONCLUSION:

Every system has its own limitations along with its brighter sides. Similarly, we have also incorporated some of the limitations as follows-

1. **No host identification:** In our website there is a lack of host identification i.e. the program will not be able to identify the host of the meeting present in a room. Since in this app the teacher can only conduct a meeting, he / she will be identified as the host but our program will not be able to identify the host for the meeting present in a room

2. **No scope for camera and audio toggling:** In our website there is a lack of camera and audio toggling i.e., the admin or any participants in the on-going call cannot toggle each other's camera as well as the microphone. This is a part of limitation. Suppose during an on-going class when a teacher is teaching and a student's microphone is suddenly turned on by mistake or due to any glitches, the teacher or any student can turn their microphone off easily if this feature would have been there. Also if some students' or teachers' video camera is suddenly turned on when it is not supposed to, any other user present in the room could have tuned the camera off in presence of this feature.

3. **Students can't create a meeting:** Now we have built a feature that students can't create a meeting only teachers would have that access. So, this is quite a problem. Let's take an eg, if the students get group project they need to do an online meeting but no one can start the meeting. As this is a study hub students must also get access.

4. **No Time limit for document or assignment upload:** Assignments can be uploaded late; it would be nice to have an expiration date/time when they cannot be uploaded at all. It is a limitation because students can upload their assignments anytime they want, but assignments must be uploaded on time. Hence, the time limit for document upload must be there.

Keeping the limitations of our system in our head we can explore further to overcome those and to have a blooming prospect of our application in future.

1. Import white board: We can import white board facility so that it become easier for teachers to teacher student.

2. Attendance: Due to shortage of time we couldn't implement something that would keep track of attendance of the students.

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For Upload and download document section:

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- https://codingshiksha.com/
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- https://youtu.be/_xDCVt1F6O0
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