



VIT[®]

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

EduLearn An E-Learning Website

CSE3001- Software Engineering Project

SLOT: D2(ETH)

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Submitted To - Prof. PREETHA EVANGELINE D

Winter Semester(2020-2021)

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1. INTRODUCTION

1.1 ABSTRACT:

In this technology driven world the most activities we do are involved with some kind of computer. As the involvement of computer in a society increased we kept on thinking of more ways to integrate this computer further into our lifestyles. As a result of this every problem which comes in our lives, we believe that it can be computable and resolved by application of new technologies. this period has led in radical advancements in the field of technology and achieved various things. The use of internet has made every small aspect of a life easier which also includes education. This e- learning website is a try from our side to contribute in this belief.

1.2 AIM:

The aim of or Project is to:

- Enhance the quality of education and teaching through our e-learning website.
- Providing a single place for the student to excess notes, lectures and community forms for Q/A.
- Improve the time flexibility and user accessibility so that learners can engage with the learning process in an effective way.
- To minimise the number of distractions for a learner and make his learning process seamless.

1.3 OBJECTIVE:

Our objective is to create an E-Learning website from scratch. We will make a learning platform that motivates people to improve their skills. We want to provide a fun, interactive, and easy to use application for the user to learn how to code. We aim at giving the learner all the materials sufficient for learning a topic in one single platform.

1.4 SCOPE:

We have made a learning platform that is unique in its functioning than any other existing platform we knew. This platform is dedicated to providing all the information to the user at a Single platform and provide a fun, interactive, and easy to use application for the user to learn how to code. We aim at giving the learner all the materials sufficient for learning a topic in one single platform. The students can search for a topic and find all the links to every topic related to the search.

The learner will be provided with theory as well as video suggestions related to the query typed.

The product will have a simple and user friendly user interface, which provides theoretical notes as well as interactive lectures on the same single platform.

2. ALREADY EXISTING MODELS:

1.Youtube: The very popular youtube application and website have a feature called playlists that offers dedicated landing pages, consisting a collection of educational videos on a variety of topics. The playlists have organizational features. The pages are also notably free from recommended videos, letting viewers focus on their lessons without distractions. But the existing model does not provide any theoretical information , i.e only an explanatory video is provided and the learner is supposed to exit the app and surf the internet for notes and theory.

Research article:

The African Journal of Information Systems

Volume 9 | Issue 4

Article 2

September 2017

An evaluation of educational values of YouTube videos for academic writing

Gbolahan Olasina
University of KwaZulu-Natal, South Africa, gbolasina@yahoo.com

The aim of this paper is to assess the impact of YouTube videos on the performance of students. While the platform provides a ton of free interactive video lectures, it does have a lot of distractions to the students. Majority of **students were found to get distracted by other video recommendations** and were not able to focus on the topic they were supposed to study. Also, it **does not provide students with theory notes for reference**, until given by the channel owner in the video description.

2.Moodle/Schoology etc: These online learning platforms are an integrated set of online services that provide trainers, learners and others involved in education with information,tools and resources to support and enhance education delivery and management. But they only serve as a platform to upload assignments, therefore do not serve as a fully built online classroom.

Research article:



Research Paper

The Effect of E-Learning Based on Schoology and Student Interest to Metacognitive Thinking Skill of Vocational High School Students in Archival Subject

Tati Suryati, Suryana, Kusenendi

Indonesia University of Education

Corresponding Author: Tati Suryati

The paper clearly conveys the role played by the schoology platform in E-Learning. It enables the teacher with the method of how to increase student's interest in learning by using the existing learning model so that it can have many ways to improve the ability of student's meta cognitive thinking skill. so that students Capable of evaluating strengths and self-weakness, knowing the benefits of science, applying knowledge to solve problems, and being able to implement strategies in solving problems. But it just serves as a LMS, and **does not aid in providing students with any learning materials.**

3.GeeksForGeeks/Tutorials point etc: These platforms just give the theoretical knowledge, and the learner needs to surf another websites, if looking for a more interactive way of learning, eg Video lectures. Our E-Learning website will help school/college students choose among a variety of courses from a variety of websites, through a single platform. It will also provide video solutions on desired topics by the students.

Research article:(Udemy)

Revista Economică 70:3 (2018)

UDEMY: A CASE STUDY IN ONLINE EDUCATION AND TRAINING

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The aim of the paper is to present a comparative analysis between the Udemy platform and the most important online learning platforms in the World. It can be easily deduced from this paper that the main advantages of udemy are: easy access to information, flexibility, convenience, time saving, multitasking, connectivity, different approaches, etc. However it is a **paid platform**, so students who do not have any source of income will not get facilitated by the service. Also, it only provides video lectures, and gives **no option to students to ask doubts or access theory notes**, which further adds to the cons.

3. PROPOSED METHODOLOGY:

3.1 ABOUT OUR PROJECT:

Our E-Learning website will help school/college students choose among a variety of courses from a variety of websites, through a single platform. It will also provide video solutions on desired topics by the students.

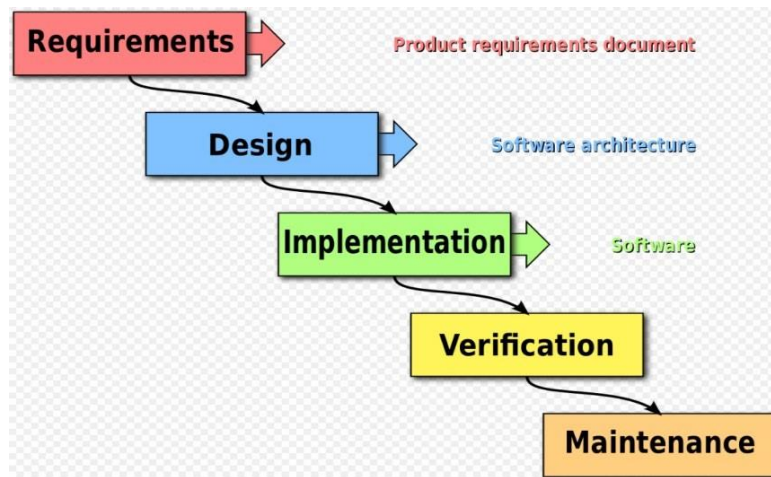
- The students can search for a topic and find all the links to every topic related to the search.
- The learner will be provided with theory as well as video suggestions related to the query typed.
- Simple and user friendly user interface, which provides theoretical notes as well as interactive lectures on the same single platform.

3.2 PROCESS MODEL

The requirements of our project are very clear and fixed. There are no ambiguous requirements, and the requirements and scope are well understood.

Therefore, the waterfall model will be suitable for the development of our project. Since:

1. It is simple and easy to understand and use.
2. It is easy to manage.
3. It works well for smaller and low budget projects where requirements are very well understood.
4. Clearly defined stages and well understood.
5. It is easy to arrange tasks.
6. Process and results are well documented.



3.3 Requirements Analysis:

3.3.1 Functional

Main Page:

Description and Priority

Main page is the first page which a user visits and is important as it gives an introduction and overview of the features of the website and contains the overview of the website along with link to the login module and the FAQ module too.

Stimulus/Response Sequences

The user when enters this page can scroll and look at the different features of the website in a well put up manner and can also click the FAQ and login/signup button to go to the respective pages.

Functional Requirements

REQ-1:A dedicated set of webpages open for all people.

REQ-2: Few options and interactive elements for the user like buttons, images linked with further pages.

Login/Sign up Portal:

Description and Priority

This feature helps a new user to create an ID on our website and it helps to login for the people who already have one. This feature is very important as it helps in personalising the interface for a user and remembers his previous accomplishments. This is a way for a user to access his dashboard and also if in case forget about his password can send him to password recovery page. It also takes care of website's security.

Stimulus/Response Sequences

The user here can enter his username and password and if correct will send him to his dashboard and if the user forgets his password it sends it to 'forgot password page'.

Functional Requirements

REQ-1: A form layout for user to enter his ID and password or other details. REQ-2: A module to encrypt the password like md5.

REQ-3: JavaScript animation or a toggle menu for the user to change to the signup page.

REQ-4: An internal mechanism to check if the password and username / ID matches with the ID and password in the database.

REQ-5: An internal mechanism to create a new user in the database. REQ-6: Links to the recovery or dashboard page. REQ-7: A dedicated web page.

Password recovery module:

Description and Priority

This feature helps a user to change his current password by a separate authentication method like sending a recovery email if in case he forgets about his password. This feature is very important as it helps a user to recover his account and is essential for it to be secure so that if an existing account it cannot be taken over by an unauthorised user.

Stimulus/Response Sequences

This page asks for an email which was entered during the signup phase, if the email matches and email present in the database then it sends a recovery email to the specified email address, which has a link to a separate page where the new password is entered twice and will only be available for 5 minutes.

Functional Requirements

REQ-1: A form layout for user to enter his email address.

REQ-2: A module to send the recovery email.

REQ-3: A dedicated web page the re-enter password page.

REQ-4: An internal mechanism to change the current password in the database and also to encrypt it to md5 standard.

Help Guide page:

Description and Priority

This feature helps a user to ask, answer, comment and upvote an already asked question, which makes this website much more community like and interactive.

Stimulus/Response Sequences

The user here can enter his doubts, statements, ask questions, upvote an already asked question and also answer a question and upvote an answer given by another user.

Functional Requirements

REQ-1:A dedicated web page.

REQ-2: A dynamic form layout and a search facility to search for questions or solutions.

REQ-3: Access to database so as to alter the questions table dedicated for this feature.

REQ-4: Inclusion of JavaScript or Ajax to prevent unease for user.

REQ-5: An integrated module to help user to upload a file or an image or video link to make the questions more effective.

REQ-6: Ability to track the session to get details of the logged in user.

Unified Dashboard:

Description and Priority

This is a place where a user can perform multiple operations like going to courses, changing his profile, assessing the Help guide page etc.

Stimulus/Response Sequences

Here multiple options are provided to the user with which staying on the same page a user can alter his profile details, go to his previous advancements and check his courses taken on the website, go to the FAQ page once the user clicks the particular option. This way he can go to multiple pages with a same element like a toggle bar which makes moving to and fro from the pages effortless.

Functional Requirements

REQ-1:A dedicated web page.

REQ-2: A link to the FAQ page, direct link to the password recovery page(without going through email verification), link to the Main page (logout button).

REQ-3: Modules like bootstrap to provide this page with a permanent menu and an area which is non permanent and contains pages like course selection page, alter profile page etc. which appeared to be in-built. REQ-4:An integrated module to help user to upload an image (for the profile image).

REQ-5: A module to enable Access to the database for functions like or trying a profile and choosing for deleting an already taken course.

REQ-6: Ability to track the session to get details of the logged in user.

Course page module:

Description and Priority

This this module consists of the information inside the course like video links ,documents, forums, text etc divided into various sections topic wise.

Stimulus/Response Sequences

This is a page where a user according to his need can navigate from different topics by clicking the respective buttons and click on various links of videos , documents, websites and assess the various material provided on the website in an attractive way.

Functional Requirements

REQ-1:A dedicated web page.

REQ-2: A link to the Dashboard page and link to the Main page (logout button). REQ-3: Modules like bootstrap to provide this page with a permanent menu for topics, subtopics, chapter name etc and an area which is non permanent and contains pages consisting of various study material and links. REQ-4: A module which enables a person to notify the teacher about any wrong information uploaded in the course. REQ-5: A module to enable Access to the database for the information present inside the course to be viewed. REQ-6: Ability to track the session to get details of the logged in user. REQ-7: A module for integration of assessments and quizzes inside the course page.

3.3.2 Non-Functional:

3.3.2.1 Performance Requirements

1. Speed: The system must return searched data in less than three seconds and incorporate a proper searching algorithm.
2. Response Time: It must have a response time of at most 3 seconds.
3. Resource Consumption: The application requires physical storage on a server to store data. This amount can vary depending upon the size of the video and theory resources . Also, the system requires a good network connection, whether wired or wireless, and needs to have the bandwidth proportional to the usage across the work site.

3.3.2.2 Safety Requirements

1. Frequency/Severity of failure: The system must be up 365 days a year with 99% uptime. Downtime will be used for server maintenance and updation of the system.
2. Recoverability: The servers will have a backup hard drive such that failure of the primary hard drive will not result in loss of data.
3. Decentralised Data Storage: In further development, the accessed and saved files of a user can be stored in a blockchain, in an encrypted form, so that no one can access them, other than the user, and there is no fear of data loss.
4. Predictability: Server maintenance and data analysis will usually be carried out during hours of minimal traffic.

3.3.2.3 Security Requirements

1. The finished product needs to have strong security features that enable only the concerned users to access the data and no one else.
2. Proper entry and registration procedures are required for users to maintain their data privacy..

3.3.2.4 Software Quality Attributes

1. Documentation: The product will be thoroughly documented such that users can find it easy to navigate and utilize.

2. Aesthetics: The product will have a clean, yet a very stylish, interface such that loading time can be minimized in order to boost browsing speed across various devices.
3. The product will be compatible with all windows operating system above windows 7.
4. Maintainability: Only the Administrators of the system will be able to update the database, for addition/ removal of study material and even users.

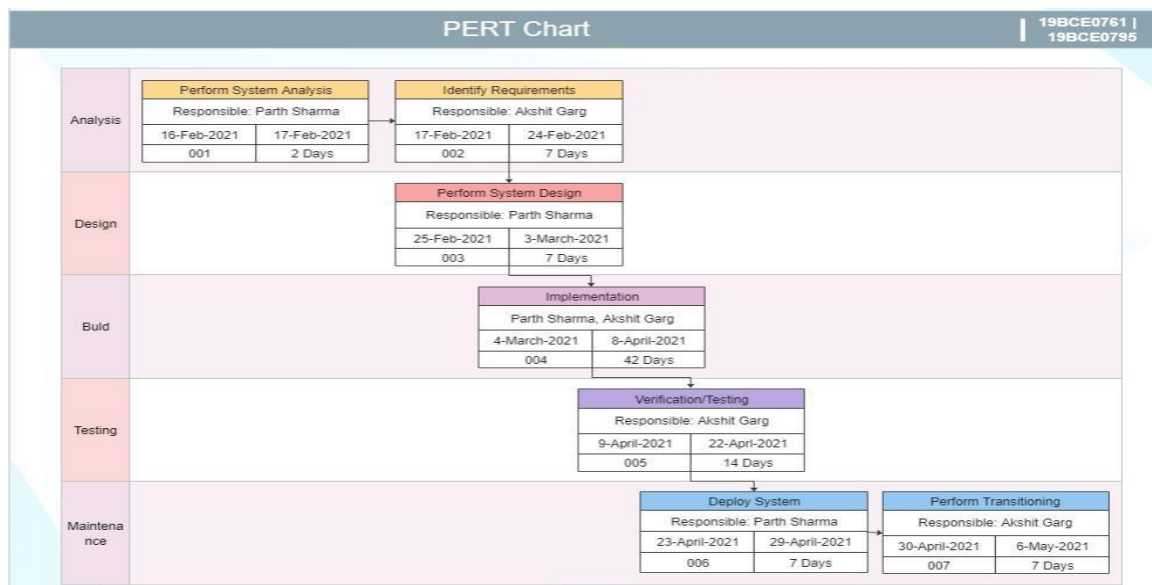
3.3.2.5 Business Rules

Customers: They can access the front-end only. The mode of operation is not made available to the public for privacy concerns.

Developers: They can access and modify the algorithms used by the system to improve the product.

Software testers: They can access and modify the backend and frontend only during software testing phases.

PERT CHART-



GANTT CHART -

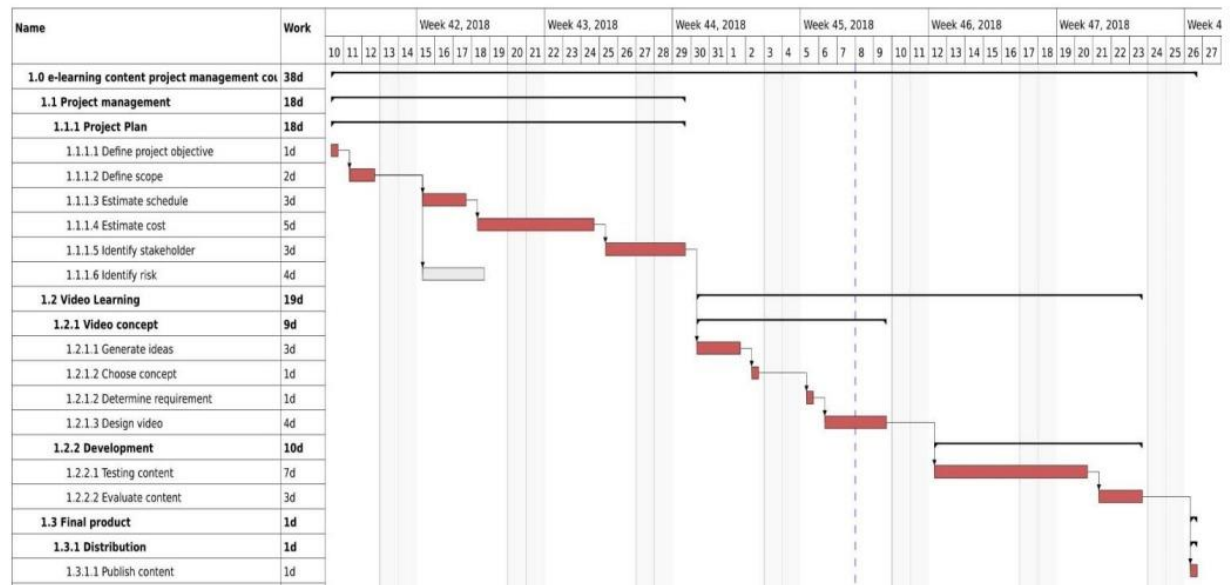
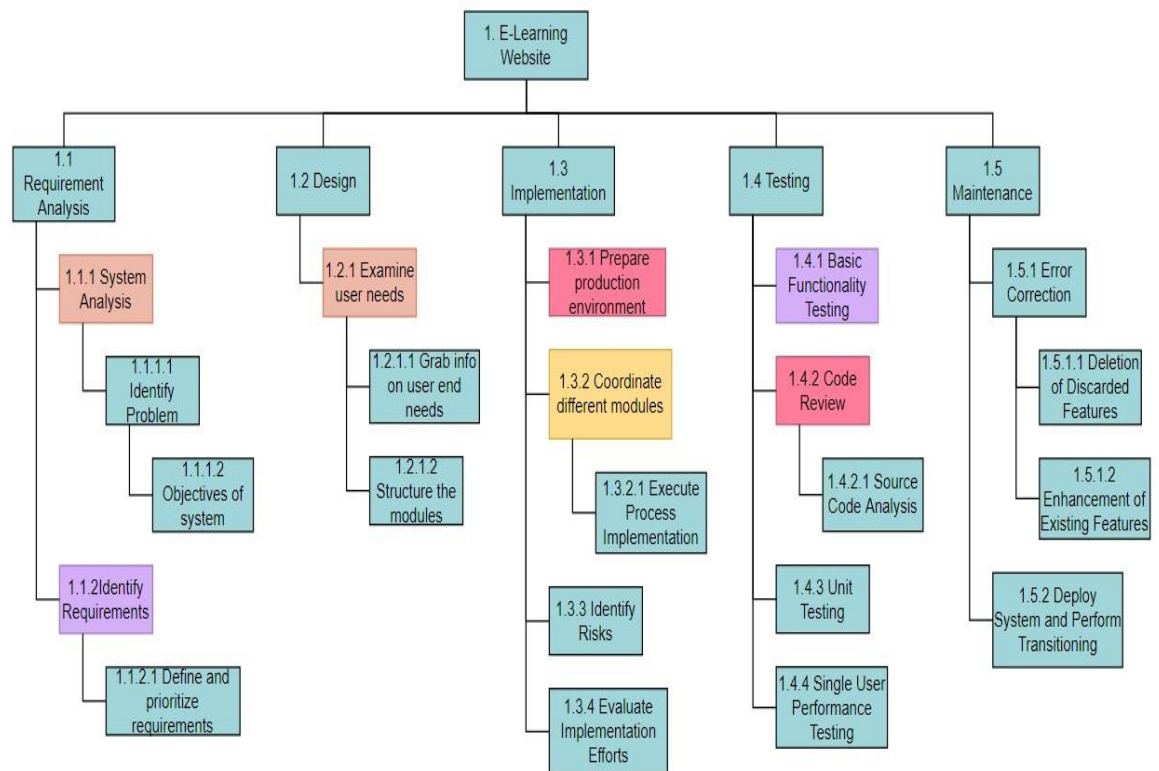


Fig. 2 Project timeline

3.4 Work Breakdown Structure



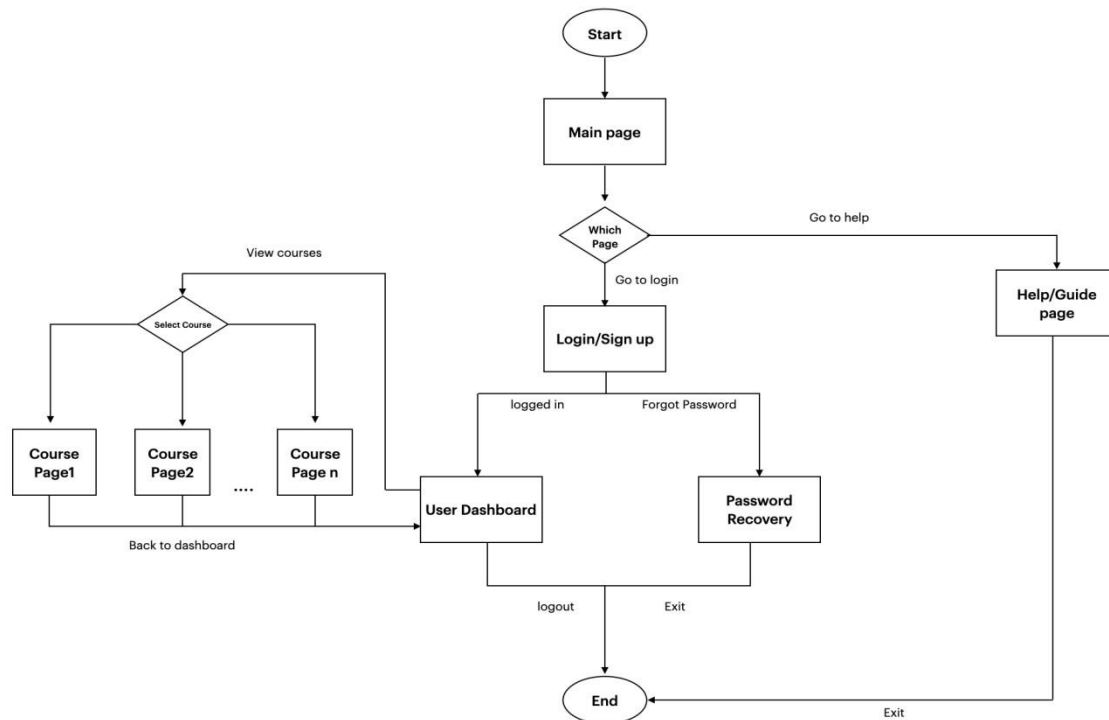
Division of work:

MEHAK CHAUDHARY	AARYAN PANDA
- System analysis	- Requirement identification
- System Design	- Verification and Testing
- Frontend Components (Dashboard, Course Page, Help page)	- Frontend Components (Home, About, Login, Signup, Forgot Password)
VANSH KARNWAL	GIRISH JOSHI
- REST API implementation	- Transitioning
- Firebase Authentication system implementation	- Deployment
- Backend(Node.js server implementation, Mongoddb connection, database schema management)	- React router and navigation system

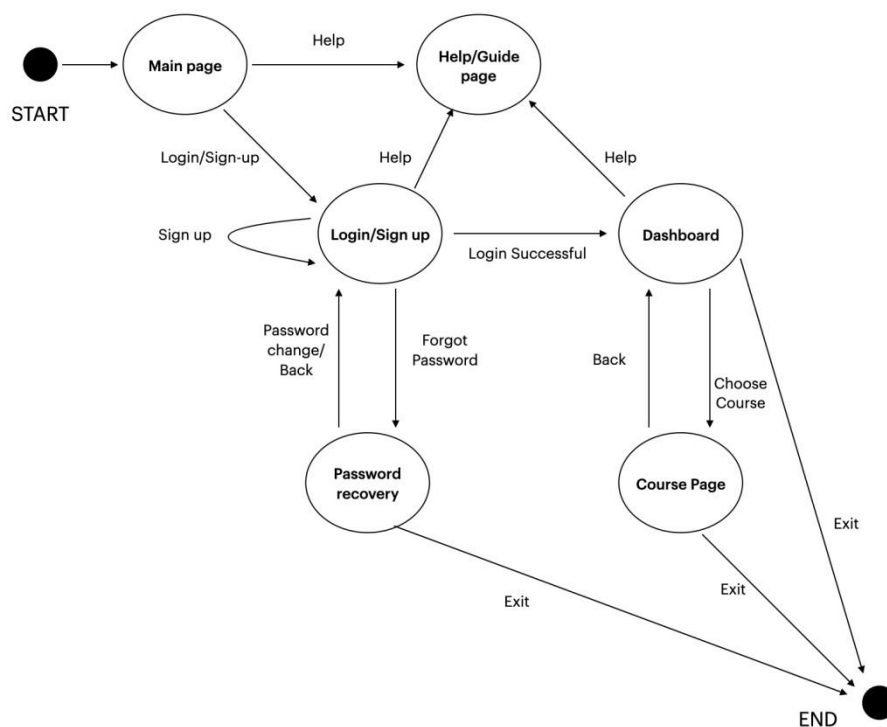
4. DESIGN:

4.1 Design Diagrams:

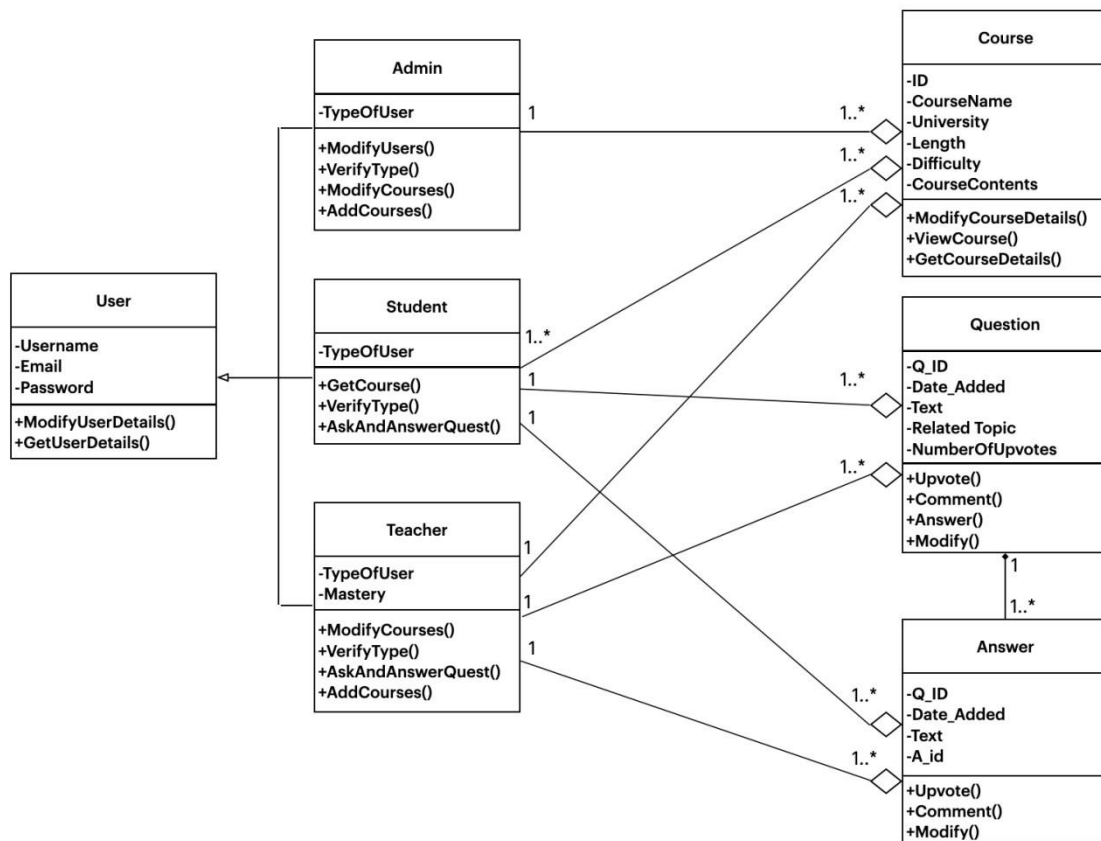
1. Flow Diagram



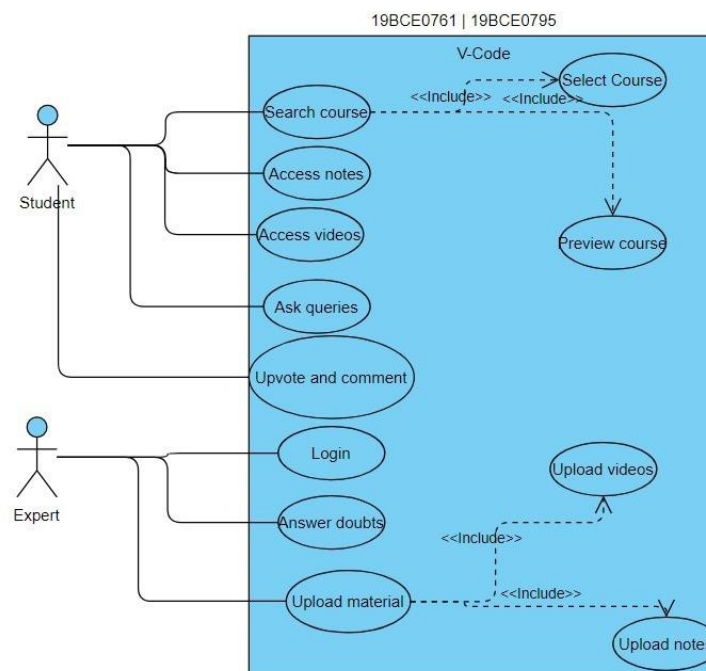
2. State Diagram:



3. Class Diagram:

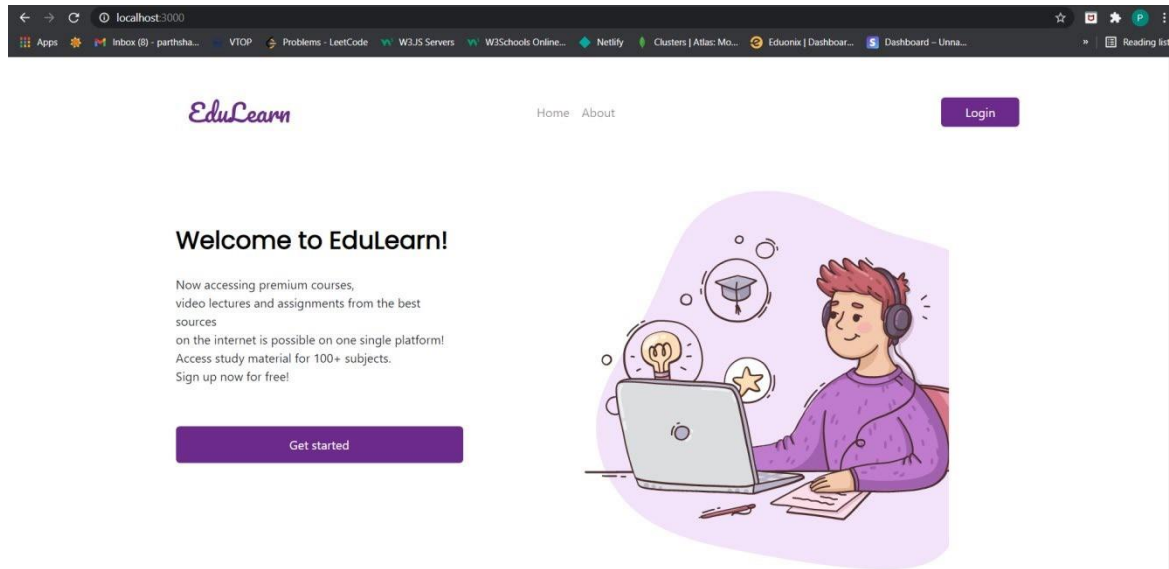


4. Use-Case Diagram

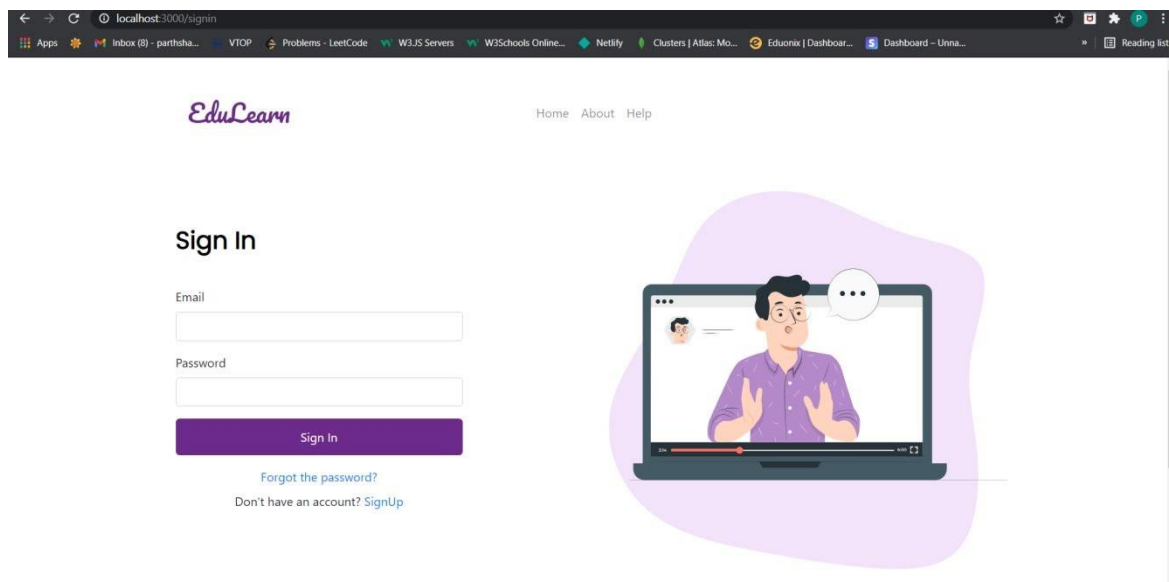


4.2 Interface Screenshots:

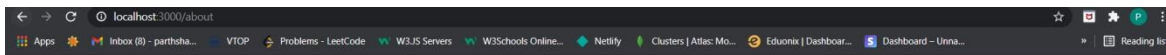
--home page



--sign in page



--about page



EduLearn

Home About

Login

This is EduLearn!

Students can now get access to, interactive video lectures and the best theory notes on the internet on one single platform!



Reduce distractions

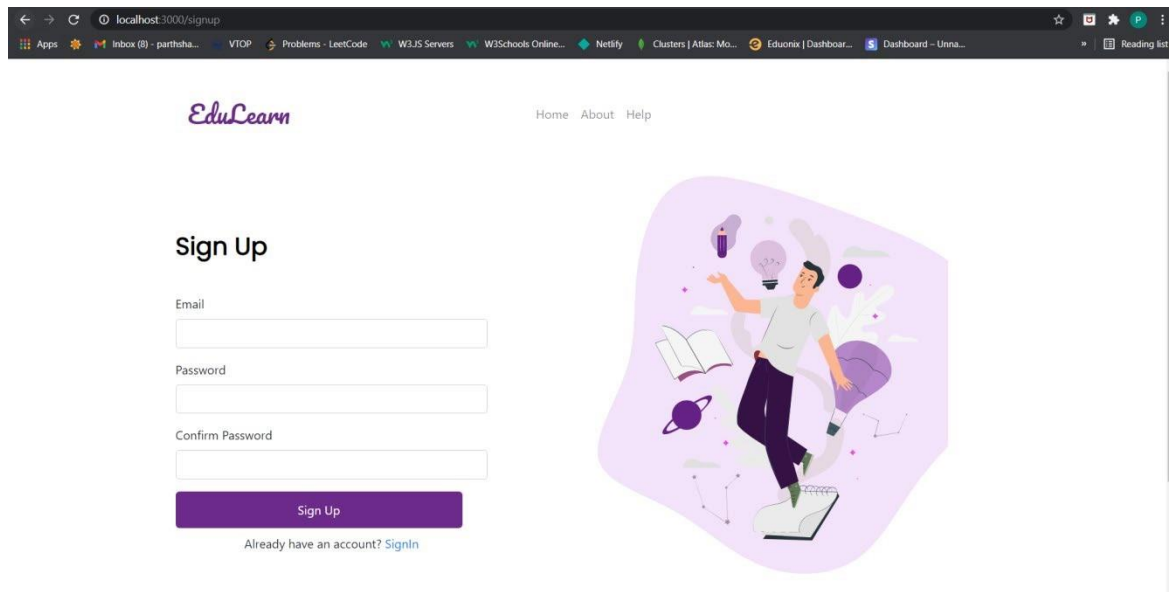
According to a study, students studying from online resources tend to get distracted easily while surfing through different platforms, switching from theory notes to video lectures, by various other media present online. Well, this can be greatly reduced by our product EduLearn where learners can get all sorts of resources required to study at one single place!

Save your precious time

No need to jump from one application to another, because here at EduLearn, you can find every required learning material, for the subject of your choice, in seconds, that too all on one single platform!

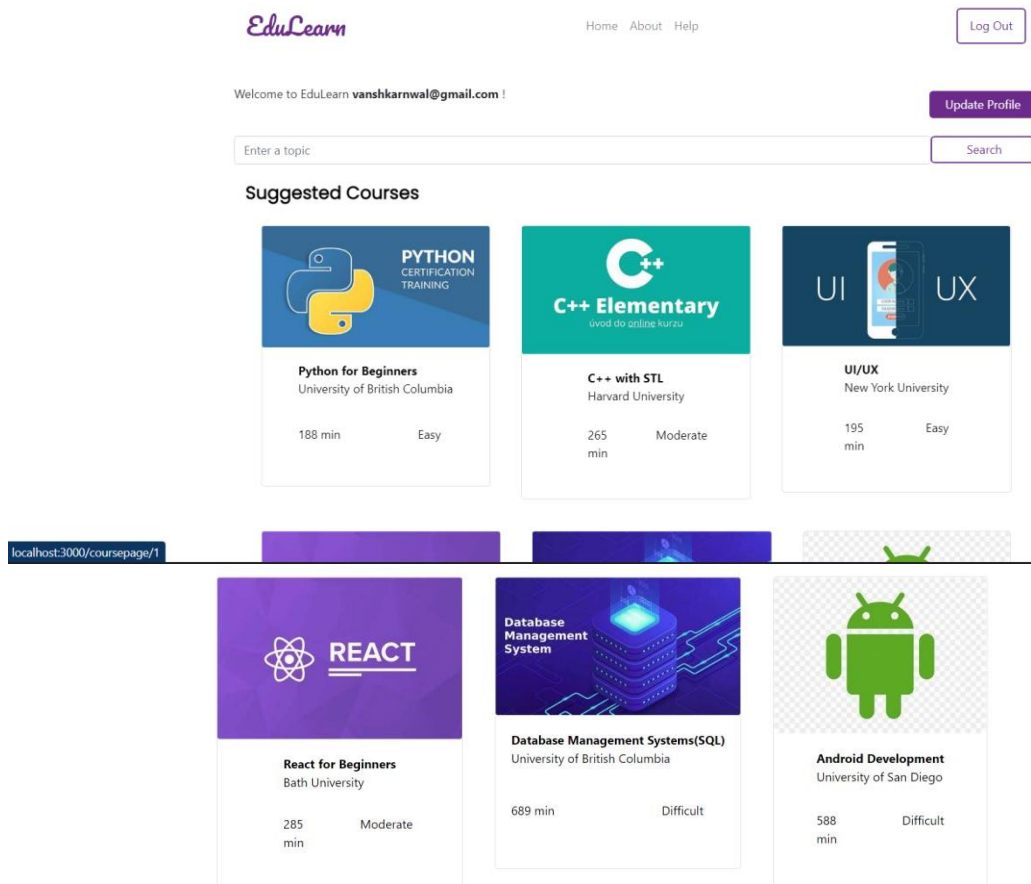


--signup page



The screenshot shows the 'Sign Up' page of the EduLearn website. The browser's address bar displays 'localhost:3000/signup'. The page features the EduLearn logo and navigation links (Home, About, Help) at the top. The main content area includes a 'Sign Up' heading, three input fields for 'Email', 'Password', and 'Confirm Password', and a purple 'Sign Up' button. Below the button is a link for users who 'Already have an account? Sign In'. To the right of the form is a large, colorful illustration of a person surrounded by educational icons like a lightbulb, books, and a planet.

-dashboard



The screenshot displays the user dashboard for EduLearn. At the top, the EduLearn logo and navigation links (Home, About, Help) are visible, along with a 'Log Out' button. A welcome message reads 'Welcome to EduLearn vanshkarnwal@gmail.com !'. To the right of the message are buttons for 'Update Profile' and a search bar labeled 'Enter a topic'. Below this is a 'Suggested Courses' section featuring six course cards:

- Python for Beginners** (University of British Columbia, 188 min, Easy)
- C++ with STL** (Harvard University, 265 min, Moderate)
- UI/UX** (New York University, 195 min, Easy)
- React for Beginners** (Bath University, 285 min, Moderate)
- Database Management Systems(SQL)** (University of British Columbia, 689 min, Difficult)
- Android Development** (University of San Diego, 588 min, Difficult)

The browser's address bar at the bottom shows 'localhost:3000/coursepage/1'.

--course page

← → ↻ localhost:3000/coursepage/1

Apps ⚙️ Inbox (8) - parthsha... VTOP Problems - LeetCode W3JS Servers W3Schools Online... Netlify Clusters | Atlas: Mo... Eduonix | Dashboar... Dashboard - Unna... Reading list

EduLearn

Home About Help



Log Out

C++ with STL

Harvard University


(A) C++ Tutorial for Beginners - Full Course

Watch later Share



C++ in 4 hours

FULL COURSE

Watch on 

COURSE OVERVIEW

Course Name:
C++ with STL

Course Length:
265 min

Topic:
C++

Difficulty:
Moderate

Theory Notes:

C++ is the object oriented extension of C. As for C there is an ANSI/ISO standard (final draft 1998) for the C++ programming language. This will ensure that the C++ code is portable between computers.

Lecture notes on C++ ... 1 / 77 39%

Structure of the Course

C++ Books

Generality

C++ Console I/O

C and C++ Comments

Classes

Function Overloading: an introduction

Constructors and Destructors

Functions

Inheritance: an introduction

Object pointers

In-line functions

More about classes

Arrays, Pointers, and References

Function overloading

Operator overloading

SE2B2

Further Computer Systems

Course notes

Standard C++ programming

by

Dr Virginie F. Ruiz

Thumbnail 01

Thumbnail 02

--help page

EduLearn[Home](#) [About](#) [Dashboard](#)

Log Out

i want java

1

Post Comment

vansh@gmail.com

hello

Reply to this user

Add

vanshkarnwal@gmail.com

i want java

Reply to this user

Add

--update profile

EduLearn[Home](#) [About](#) [Help](#)

Log Out

Update Profile

Email


vanshkarnwal@gmail.com

Password

Confirm Password

Save Changes

To cancel making changes [Click here](#)



--forgot password

EduLearn Home About Login

Password Reset

Email

Reset Password

[Sign In](#)

Don't have an account? [Sign Up](#)

4.3 Sample Code:

Our github repository: <https://github.com/vanshkarnwal13/EduLearn>

5. Testing

TEST CASES:

TEST CASE ID	TEST CASE SCENARIO	TEST CASE	PRECONDITION	EXPECTED RESULT	ACTUAL RESULT	STATUS
1	Enter email and password to login	Check results on entering valid email and password	User is registered successfully	Correct info -> successful login Incorrect info -> "Invalid credentials" message displayed	Email and password are cross-checked from database and situation is handled as expected	Pass
2	Enter email to get link for password reset	The email must be verified to be existing and registered, and a mail must be sent to the address with link to reset password	User is registered successfully	Correct info -> password reset link received successfully Incorrect info -> "Email does not exist" message displayed	Email is verified to be valid and registered. A corresponding email is sent to the entered address with password reset link, if email verified.	Pass
3	Enter a topic name to search	The topic name entered must be searched in the courses table and related courses must	User is registered and logged in successfully and is present on the dashboard page	If entered topic exists in database -> All courses related to the topic are	The entered topic is searched to exist in database and	Pass

		be displayed on the dashboard.		displayed If entered topic does not exist in database -> "No results found" message displayed	situation is handled as expected	
4	Click on a course card	The Frontend should fetch the course page details from the backend and database and take the user to course page module, where they can see video lecture and theory notes related to the course	User is registered and logged in successfully and is present on the dashboard page	User should be taken to the course page of the particular course card they clicked, and must be displayed the video and theory notes related to the course.	The frontend correctly fetched course page information and user was displayed the course page with related video lecture and theory notes	Pass
5	Add a question in help page	The frontend should fetch entered text and user info to backend, which saves the data in a dedicated database, to display the user info and question raised, to every user of the website	User is registered and logged in successfully and is on the help page	If text is entered and submit button is clicked -> The user info and question raised must be visible on the help page, to every user.	The question, with the user info was displayed on help page, when submit button was pressed	Pass
6	Answer a question on help page	The frontend should fetch entered text and user info to backend, which saves the data in a dedicated database, to display the user info and answer replied, to every user of the website	User is registered and logged in successfully and is on the help page	If answer is entered and submit button is clicked -> The user info and answer replied must be visible on the help page, to every user.	The answer, with the user info was displayed on help page, when submit button was pressed	Pass
7	Click Log Out button to logout of the website	The router module should take the user to the landing page of website and must run the <code>handleLogout()</code> function and <code>useHistory()</code> to successfully logout the user from the website	User is registered and logged in successfully and is on the dashboard page	If no internal errors/ network errors are encountered, Logout the user from website and take them to the landing page Else, display message, "Failed to log out".	The user is logged out successfully and is directly taken back to the landing page.	Pass

6. Conclusion:

Our platform has proven itself quite effective in the following scenarios.
it has provided users with a better way of presenting the information and has thus enhanced the quality of education and teaching.

- This platform provides a single place for the student to access notes and lectures and also to ask questions to the fellow students and teachers.
- The user can choose his pace of learning and improve time flexibility and user accessibility.
- This website will prevent any user from distracting from the content with objects like recommendations and pop-ups from other sites or while moving from one site to another.

7. Future Enhancements:

This project provides a lot of room for future enhancements, to mention some of these: •

In the help section the user can Upvote a doubt so that repetition is prevented if the same doubts are to be asked.

- In the help section the user can tag which course he is referring to so that more clarity is provided to the faculty.
- In the main page the user can be shown the recommendations based on his searches and previous courses taken so that it is easy for him to navigate to a course if he is lost. •

Trending section of the most viewed courses can be added which will guide user to a course to start with. • The data can be stored in a De-centralised way so that the data is secured and protected.

8. References

- <https://www.chapter247.com/blog/how-to-build-a-react-crud-application-using-mernstack/#:~:text=How%20to%20build%20a%20react%20CRUD%20application%20using,complete%20server%20implementation%20in%20the%20server.js%20file.%20>
- <https://www.tutorialspoint.com/firebase/index.htm>
- <https://firebase.google.com/docs/auth/web/start>
- <https://www.youtube.com/watch?v=WhlNnf1711M>
- <https://www.w3schools.com/react/default.asp>
- <https://nodejs.org/en/docs/>
- <https://reactjs.org/docs/getting-started.html> • <https://docs.mongodb.com/>.