PAATHSHALA – A VIRTUAL CLASSROOM ON THE PHASE OF PREVALENT EPIDEMICS IN THE CHANGING WORLD.

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ABSTRACT

In the last many decades, education has witnessed some advances in technologies involving computer-backed literacy that promises to drastically change the styles of tutoring and literacy. The World Wide Web has played a major part in information storehouse and dispersion in the educational community. Conventional classroom-grounded tutoring involves the delivery of course accouterments by the speaker in a particular place at a defined time. Hence it imposes a constraint of time and place on both the educator and the pupil. Due to mortal factors arising from the traditional classroom system, the speaker may not always be suitable to put in optimum trouble towards preparing and delivering course accouterments. There may also be inconsistencies in the pedagogy and literacy style due to the repetitious nature of tutoring/literacy. The idea of this paper is to develop a virtual classroom system to enhance learning on the lot. The system was developed using PHP and MySQL as garçon side programming and database independently. The web-grounded virtual classroom provides a web-enabled interactive model fore-learning in which the course material is presented using multimedia and hypermedia.

Keywords: *Virtual classroom, e-learning, multimedia, education.*

INTRODUCTION

With the added use of network computers, the Internet, and advances in telecommunication technology, e-Learning has been extensively honored as a precious tool for literacy and training. The traditional means of advanced education have remained dominant in seminaries in some developing countries. With the significant growth of learning, preceptors and scholars typically explore new ways of constructing knowledge. The current technology being heavily delved into as an educational platform is the World Wide Web(WWW). The WWW which represents a platform for information storehouse and dispersion can be penetrated in minimal time, and this is

veritably important to the educational community. The fact is that the transition from a digital peak society to a global vill information society causes the traditional educational model to be unfit to cover the educational requirements of ultramodern societies. The globe is faced with a transition from a static frugality to a new knowledge-driven frugality.

Population explosion and adding admission requests into seminaries in every region of the world brought lesser constraints on the coffers of several seminaries. In case, there's a problem of a shy number of mortal and material coffers to feed the education of the large population. The population of academy-age citizens in utmost places has grown extensively to the extent that only a small chance can be offered admission. A new literacy terrain needs to be created which will give autonomy and inflexibility, establish connections and easy communication between centers of culture and knowledge, and grease easy access for all citizens of a knowledge-grounded society. Conventional classroom-grounded tutoring involves the delivery of course lectures by the speaker in a particular place at a specific time. Hence it imposes a constraint of time and place on both the educator and the pupil. Due to the mortal factor, the speaker may not always be suitable to put the optimum trouble towards preparing and delivering course models.

The remedy to this situation seems to be the literacy ways that are grounded on ultramodern technologies similar to the Internet and WWW combined with traditional classroom tutoring. One of the ways this can be achieved is through the use of virtual classrooms. A virtual classroom is a terrain conducive to literacy, which takes place in cyberspace. It provides the tools that learners need and brings together preceptors and learners to partake in information and ideas. A virtual classroom is a special form of relearning that finds applicable operations in perfecting the conventional literacy styles editorialized that learning can be stationed using a wide range of technologies and media.

The virtual classroom has its roots in the study of computers in education similar to computer-intermediate instruction and multimedia as an educational tool. These broad fields covered not only hypermedia, similar to web-grounded hypertext but also on-internet educational software design ranging from media academy surgery tutorials to interactive CD-ROM terrain atlases. Numerous of the issues facing these virtual classrooms, similar to the evaluation of interface design, integration of computers into course design, and social issues of computing are largely applicable to the design and use of internet-grounded virtual classrooms.

Present technologies enable the creation of virtual classrooms using the Internet and its coffers. For the preceptors and trainees, a benefit of the Internet as a platform for the virtual classroom is

that the information that can be stored is nearly measurable. One of the benefactions of a Virtual Classroom(VCR) is that access to high-quality and flexible literacy technologies. The information being electronically stored can be penetrated or downloaded by learners at their own pace, thereby booting the constraint of time and place endured in classroom- grounded literacy. The involvement of distance literacy includes tutoring using telecommunication tools, which transmit and admit multitudinous accouterments through data, voice, and videotape. There's also an increased use of virtual classrooms(online donations delivered live) as an online literacy platform and classroom for a different set of education providers. In addition to virtual classroom surroundings, social networks have come an important part of relearning.

LITERATURE REVIEW

Quite a lot of studies live relating toe-learning, distance literacy, and virtual literacy. These terms are occasionally used interchangeably. According to(5), e- learning means literacy that makes use of a network for delivery, commerce, or facilitation. This type of literacy includes distributed learning and distance literacy. Computer- Grounded Training(CBT) is delivered over a computer network and web-grounded training(WBT). It may be computer-grounded, coetaneous, asynchronous, educator- grounded or a combination of the forenamed.

Former workshops in the area of the virtual classroom will be bandied in this section following their literal development of VCR, architectural design and system perpetration, and provision of e-learning platforms for the impaired. The paper in(4) addresses the history of distance literacy, current issues, the civil government's part, and four specific areas of enhancement including classes change, new patterns of commerce, changes in organizational structures, and the places and conditioning of actors in both business and academic distance- learning surroundings.

A model for perfecting online educational systems for both preceptors and learners was proposed in (11). The model allows for more accurate assessment and further effective evaluation of the literacy process. The model includes logistics systems to show that it could be necessary to integrate systems that handle a payload of handbooks and other physical accouterments to distance scholars. The study in (6) discusses the architectural design of an intertwined system for the delivery of lectures in a virtual terrain. The armature and description of the system factors are presented with the ways and recommendations for the perpetration of the designed system. The system armature is multi-tier, modular, scalable, and erected for rigidity to the database middleware suite. All functionalities within the operation are delivered using web services, communicate via assiduity standard XML messaging and access is pure via a web cybersurfer.

The study in(7) discusses gests in developing VCM with different authoring tools and evaluates their effectiveness. The results of the check shows that this exploration proved that the replier scholars veritably well entered the Virtual Classroom Module(VCM) developed.

Related Works 1. Piazza

Piazza is a literacy operation system that allows scholars to ask questions in a forum type format. preceptors are suitable to moderate the discussion, along with championing accurate answers. The software was constructed by Pooja Nath in 2009 in order to speed response times and produce a common place where scholars could engage in discussion outside of the classroom. Utilising an expansive announcement system and a simple layout, the response time on Piazza pars roughly 14 twinkles. preceptors also have the capability to allow scholars to post anonymously, encouraging further in-depth discussion. druggies can intimately(and anonymously, if the head educator allows it) ask questions, answer questions, and post notes. Each question prompts a collaborative answer to which any stoner can contribute and an educator answer, shown directly below, which can only be edited by preceptors. Multiple scholars are allowed to contribute to each answer like Wikipedia entries, and each answer has a interpretation history that shows what each pupil wrote. druggies are allowed to attach external lines to posts, use LaTeX formatting, view a post's edit history, add followup questions, and admit dispatch announcements when new content is added. The interface consists of a dynamic list of posts on the left side of the screen, a central panel for viewing and contributing to individual posts, and an upper bar for account control. According to the company's data, the average Piazza question is answered within 14 twinkles. Individual Piazza classes are tone-contained and can be locked with an access law. Anyone may produce a class, but the head educator retains full control over the class content, along with executive capacities similar as championing good answers and viewing more detailed statistics on class exertion.

2. Google Classroom

Google Classroom is a free amalgamated literacy platform developed by Google for educational institutions that aim to simplify creating, distributing, and grading assignments. The primary purpose of Google Classroom is to streamline the process of participating lines between preceptors and scholars. As of 2021, roughly 150 million druggies use Google Classroom.

Google Classroom integrates a variety of other Google Applications for Education, similar to Google Docs, Google wastes, Google Slides, Gmail, and Google timetable into a cohesive platform to manage pupil and schoolteacher communication. scholars can be invited to join a class through a private" class law", or be imported automatically from an academy sphere. preceptors can produce, distribute and mark assignments all within the Google sphere. Each class creates a separate brochure in the separate stoner's Google Drive, where the pupil can submit work to be graded by a schoolteacher. Assignments and due dates are added to Google timetable, where each   assignment can belong to an order or content. preceptors can cover each pupil's progress by reviewing the modification history of a document, and after being graded, preceptors can return work along with commentary and grades.

Proposed Methodology

Some of the initial features of the application will be as follows:

- Simple, intuitive, and interactive UI

- Easy Onboarding

- A personalized Classroom web application that keeps data secure by not using any third-party application.

- Supports multi-user tier of admin, faculty, class representative, and students.

- In-house assignment submissions and grading.

- Dynamic real-time timetable avoiding conflict between classes, streamlining student experience.

- Easy access/download to study resources.

- Dedicated forms section for feedback, doubts, etc. with the added functionality of reminders.

- Tracking attendance of a student using an interactive chart.

- Dedicated section for placement-related information, enabling students to apply for ongoing placement drives.

- Dedicated Class space and institution space for discussions.

Motivation

The effect of an epidemic on the education sector has redounded in the shift of education mode to online. From classes to tests, everything was forced to be nearly. ignorance and randomness to the situation could affect the studies. Hence, there's a need for an operation that enables preceptors as well as scholars to maintain the class in a systematized manner. Also, it must total all the academic conditioning while keeping data secure. Conventional classroom-grounded tutoring involves the delivery of course lectures by the speaker in a particular place at a specific time. Hence it imposes a constraint of time and place on both the educator and the pupil. Due to the mortal factor, the speaker may not always be suitable to put the optimum trouble towards preparing and delivering course models.

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Present technologies enable the creation of virtual classrooms using the Internet and its coffers. For the preceptors and trainees, a benefit of the Internet as a platform for virtual classrooms is that the information that can be stored is nearly measureless. One of the benefactions of a Virtual Classroom(VCR) is access to high-quality and flexible literacy technologies.

The information being electronically stored can be penetrated or downloaded by learners at their own pace, thereby booting the constraint of time and place endured in classroom-grounded literacy. The involvement of distance literacy includes tutoring using telecommunication tools, which transmit and admit multitudinous accouterments through data, voice, and videotape. There is also an increased use of virtual classrooms(online donations delivered live) as an online literacy platform and classroom for a different set of education providers. In addition to virtual classroom surroundings, social networks have come an important part of learning.

Also, an In-house Virtual Classroom brings several benefits of its own. It enhances the scalability and cost-effectiveness of the overall result. It offers customizations, which were not possible before with third-party results.

Some of the customizations are described below.

1.   Devoted Institute space

2.   Added up academic conditioning

3.   Pupil document upload and verification

4.   Virtual examinations

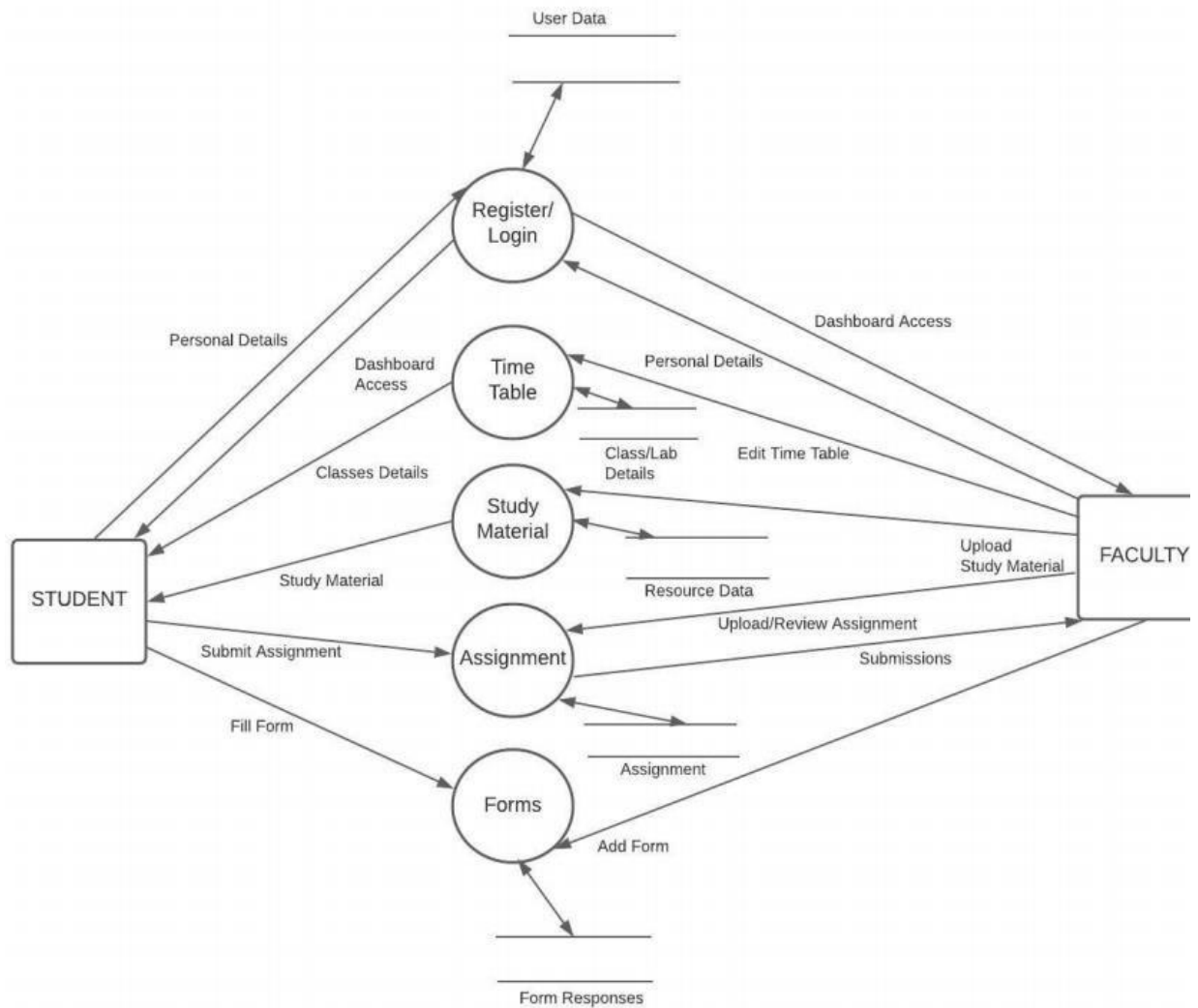5.   Control over institute data

6.   Instant bug fix

Also, It resolves the issue of data security.

PLAN OF WORK
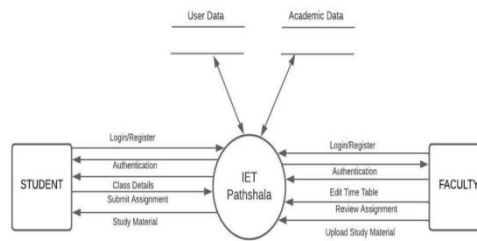
(System Design) Data Flow Diagrams

The following two diagrams are the data flow diagrams (level 0 and level 1) of the system with two external entities: Student and Faculty.

The level-1 diagram has four processes:

Time Table, Assignment, Forms, Study Material, and data flow is being shown.

Use Case Diagram

In the following figure, the use case diagram is showing two actors: student and faculty. Students can view the timetable, submit the assignment, view study material, view forms. Faculty can add and view forms, study material, view and edit time-table, and can review assignments. References will be used for connecting between different Database models instead of encapsulating data in the student model. Some of the Database models will be as follows: -

●Assignment

●Attendance

●Chapter

●Form

●Notification

●Reminder

●Subject

●Submission
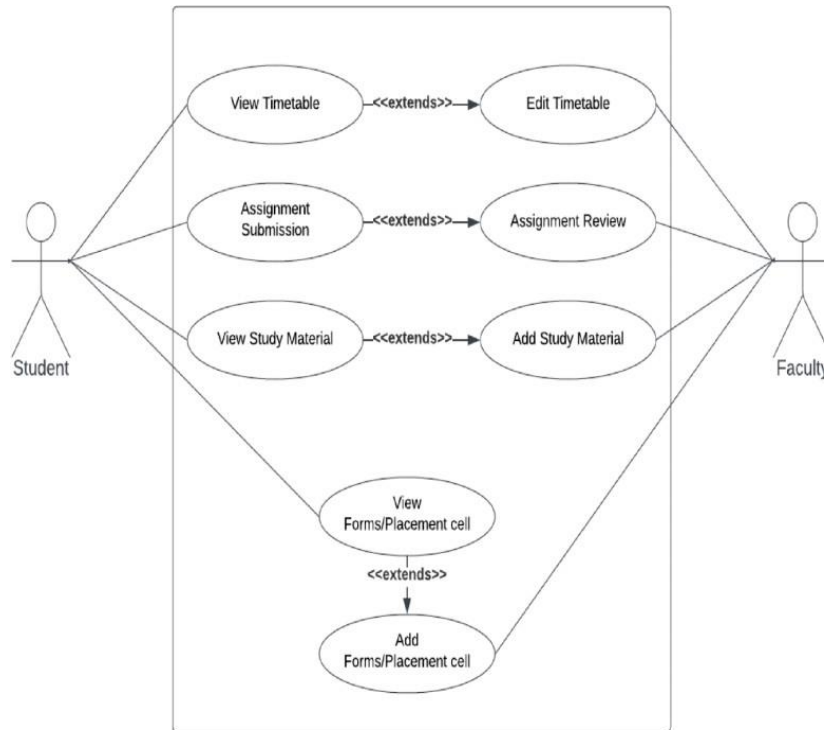
Major technologies used in the whole process are described as follows: -

● Backend- NodeJS, ExpressJS

● GUI Frontend- HTML/CSS, Bootstrap, JavaScript

● IDE- Visual Studio Code

● Database- MongoDB Atlas

● API Usage- Google Open Source APIs

● Version Control System- Github

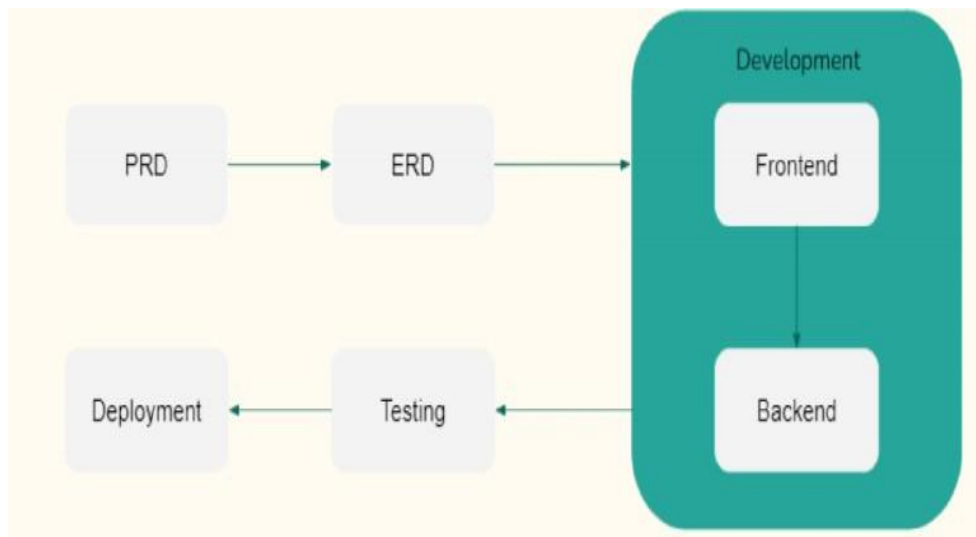● Deployment- Heroku

3.3 Languages Used

Figure 3.3 shows different stages of the Software Cycle Action plan.

● PRD (Product demand Document)

A product conditions document (PRD) is a document containing all the conditions to a certain product. It's written to allow people to understand what a product should do. A PRD should, still, generally avoid anticipating or defining how the product will do it in order to latterly allow interface contrivers and masterminds to use their moxie to give the optimal result to the conditions

● ERD (Engineering Requirement Document)

An engineering conditions document (ERD) is a statement describing the thing and purpose of a new element. Unlike a product conditions document (PRD), which tells masterminds what they need to make, an ERD specifies why a part is being erected and how its design energies its purpose. By following the engineering conditions outlined in an ERD, masterminds can insure that the part they make will satisfy client requirements.

Software Development Life Cycle (SDLC) model: -

• Nimble model /Agile Model

Nimble software development refers to a group of software development methodologies grounded on iterative development, where conditions and results evolve through collaboration between tone- organising cross-functional brigades. nimble styles or nimble processes generally promote a disciplined design operation process that encourages frequent examination and adaption, a leadership gospel that encourages cooperation, tone- organization, and responsibility,

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a set of engineering stylish practices intended to allow for rapid-fire delivery of high-quality software, and a business approach that aligns development with client needs and company pretensions. nimble development refers to any development process that's aligned with the generalities of the Agile Manifesto. Deployment Phases

•	Product (on AWS)

The Sprint will be of duration of one month. The first two sprints will be utilized for the PRD, ERD, and UI development as it'll be a static part and makes the testing and integration process a lot easier. For the backend features, an incremental aspect of the nimble model will be used. In the prototype, some of the abecedarian features i.e. Authentication, stoner model, etc will be enforced.

In the posterior prototypes of the operation, features will be added and integrated into the result. Backend will take three devoted sprints after the first two sprints allocated for PRD, ERD, and UI development.

RESULT AND DISCUSION

In this paper, a virtual literacy system has been developed. The new system is anticipated to serve as a remedy for the problems and weaknesses observed in the old system. It'll combine open literacy ways grounded on new technologies(in this case, the world wide web) with conventional classroom tutoring, The main intention is to make the literacy experience more flexible, stimulating, and available around the timepiece and at any place with Internet installations. The scholars will be suitable to navigate freely within the virtual classroom terrain and enhance the information coffers used by the scholars.

ONBOARDING FLOW

To get a user onboard, they must register on the page (shown above) first. During the registration/sign-up, we are storing the user's information as Name, Branch, Semester, Email id, and password (to be generated), and a file of a photograph.

This will allow users to get registered with IET Path Shala. To get started, a user is required to sign-in

FORMS

Forms section is one channel with which Teachers, CRs etc. can provide some information and can take inputs from students. Example: - Feedback Form, Doubt Clearing Form, Consensus Form etc. In these forms, teachers will post the information and the link leading to the google form. Students will, then, fill their inputs in the form. This will help in taking feedback on the teaching style, to clear doubts, and to take students' consensus on any topic in an organized manner.

CONCLUSION AND FUTURE WORKS

IET Pathshala is very useful in many aspects for the students as well as teachers of the institutions to aggregate all the activities at one platform in an organised manner. Through this, we are providing the facility of scheduling online live classes through google meet and providing study material, assignment posting and grading etc. Though this is currently solving several issues but can be improved in many dimensions. There will be a messaging application in the classroom where students can form different communities as per their interests and connect with each other, they can share their views and opinions, future career opportunities etc.We can also include a section for contests and competitions organised byteachers/seniors/alumni.

The students can take part in these competitions/hackathons and getinspired to perform better.An open channel, in which students can post their doubts, queries etc. and their fellow mates can solve them or help them, will be inculcated in the application. This will help to increase the spirit of self help and mutual help among students. A section of E-Library should also be there where students can access e- books of the curriculum as well as other books to help students to grow in a holistic way.It will be a step to save paper as well.

As of now, we are using google meet for the live classes, meetings etc. In the future, we can also try to build a video conferencing application of our own. It will also reduce the issues of data security and make our application self reliant. Due to the constraint of time as well as resources, we could not implement these features but this part could be done in the future as it will widen the scope of the application.

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