

VIRTUAL CLASSROOM TOOL

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Abstract

The demand for educational software is growing exponentially with the surge of interest in educational reform, internet and the distant education. Due to the wide variety of information on the Internet, students taking on-line courses. We propose a LAN based virtual classroom model to provide the instructor with the capability to call students' attention to class and to synchronize class activities. The tool provide components for instructors and students to interact effectively at the same time.VC will usher in the immense flexibility and sophistication in the existing learning platform structures, with the perfect blend of synchronous and asynchronous interaction. It provides a means of collaborative learnings for the students. Also included in the model is an FCFS floor control algorithm to regulate participants engaged in audio conferencing in an orderly fashion.

Keywords: Java (jdk 1.5/1.6), Client server (2-tier) architecture, FCFS floor control algorithm, Learning flexibility, online relationships.

1. Introduction: In this ever changing world, technology has influenced our lives in a big way. It has crept into every aspect of our lives right from the way we cook food to the way we communicate with each other. But somehow, it has failed to revolutionize our class rooms / teaching system. Just as the term virtual means a simulation of the real thing, Virtual Classroom is a simulated classroom, which provides a convenient communication environment for distance learners, just like traditional face-to-face classroom. A virtual classroom allows learners to attend a class from anywhere in the world and aims to provide a learning experience that is similar to a real classroom. VCT will provide network broadcasting of a multimedia lecture given by a trainer to multiple clients, interaction with the students, preparation, online editing and offline replay of the courses. There are basically two possible ways of implementing communication between instructor and students in a virtual classroom: synchronous and asynchronous.

Synchronous communication tools, such as ClassPoint or NetMeeting, allow the instructor to teach live lectures using resources such as audio and video conferencing, white board and text-based chat. Students can interact by asking questions, normally using a text window. Some type of floor control is normally desired, to prevent chaos and ensure that students will have their questions answered in a First Come First Served (FCFS) basis. Asynchronous tools allow information to be placed for future processing. Some common examples are: e-mail, bulletin board systems, mailing lists, and the course pages themselves. A successful virtual classroom implementation should use both synchronous and asynchronous techniques to enable one-to-one (normally instructor-to-student), one-to-many (typically instructor-to-class) or many-to-many (e.g. threaded discussions) interactions.

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2. **Course Information:** This section of the project will contain the list of all the available courses being offered to the students. Thus, allowing the students to choose or obtain knowledge of their desired course and its related lectures or have access to the related questions. If the student asks for the current status of the courses under the course information section then the current situation in the Virtual Classroom Tool System will be available and all the happenings or further proceedings will largely depend upon the information contained in this section.

3. **Requirements:**

3.1 **Hardware Requirements**

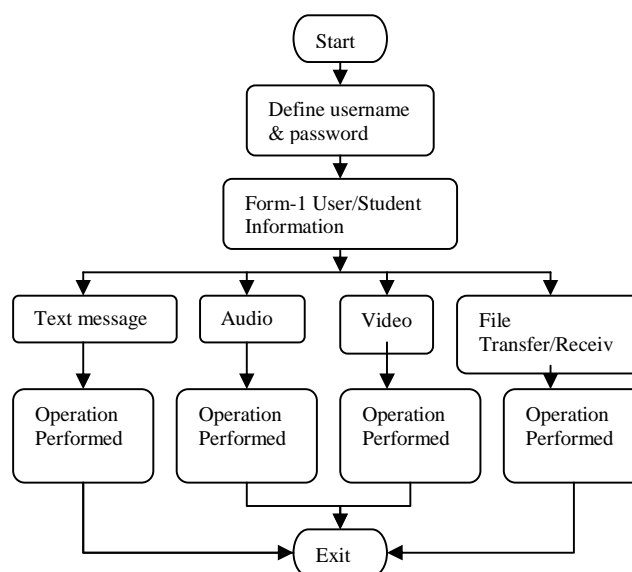
- Microsoft Windows 95/98/2000/XP or better
- Pentium4 or better
- Internet Connectivity
- Microsoft SQL Server 2003 or higher.
- Microsoft Windows Media SDK

3.2 **Software**

Java package and SQL should be perfectly installed in your system.

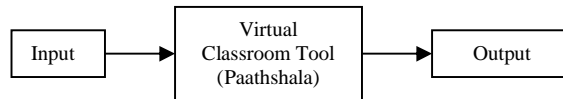
4. **Proposed methodology:** Virtual Classroom is an attempt to change our conventional classroom / teaching system and try to break free from the restrictions put forth by the conventional classroom. Paathshaala – The Virtual Classroom has a central system to which users (teachers and students) login. Each of the users and their respective location addresses in the network (IP address) will be recorded in the central application, “Kaksha-Mandala”. Here, an administrator can login and create or remove users. The Teacher uses his application, “Kaksha-Adhyapak” to log into the central server. The class then starts and “Kaksha- Mandala” will update its list of online classes. Each of the students will use “Kaksha-Vidyarthi” to log into the central server and access any of the available online classes. Then based on his choice, a direct link is established with that teacher and the student begins to receive the lecture.

4.1 **Block-Diagram:**



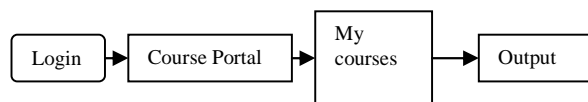
4.2 Data Flow Diagram (DFD): A **data flow diagram (DFD)** is a graphical representation of the "flow" of data through an information system. It differs from the flowchart as it shows the *data* flow instead of the *control* flow of the program. A data flow diagram can also be used for the visualization of data processing (structured design).

4.2.1 Zero Level DFD:



[Fig-3: Zero level DFD for developing Paathshala]

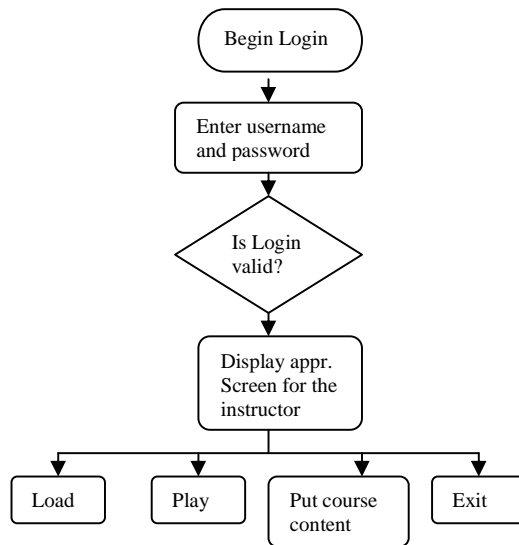
4.2.2. One Level DFD



[Fig-4: One level Data Flow Diagram for developing Paathshala]

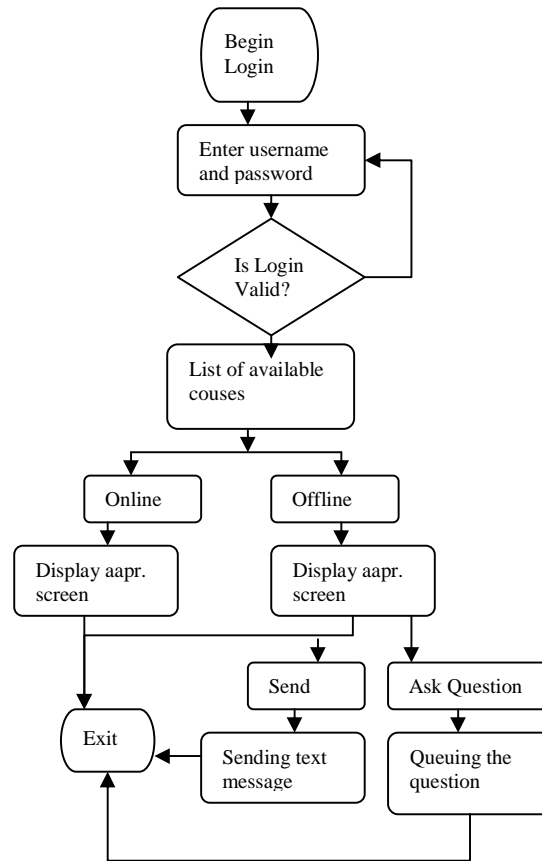
a) Flowchart

i) Instructor State Transition Diagram



[Fig-5: Instructor side Flow Chart for developing Paathshala]

ii) Student State Transition Diagram



[Fig-6: Student side Flow Chart Diagram for developing Paathshala]

5. How Pathshala (VCT) Works? : In our project we have done server side programming. The first step is to create a database which contains all the information of users i.e. lecture, instructor, and student is stored. Then we have created tables for storing this information. Now for each table we have developed beans, which will help in inserting and modifying the database. After this, the templates have been designed in which the following functionalities /facilities are provided to different users. The facilities provided by presenter interface to Faculty in our project are:

- Register new users -Presenter as an administrator has to register new users that will be attending the session.
- Create a session - Presenter has to decide the session time, users that will be invited for the session.
- Cancel a user registration- If any registered user does not want to attend the session, presenter cancels his registration.
- Share Resources - Presenter can add various resources to the session. It may be a file or just a simple web page link that participant can download at their end.
- Conduct Poll- He can create a poll for participants. Also he can chat with participants.

- Explain concepts using Whiteboard- He can use whiteboard to explain some of the topic, which may not be able to explain via presentations, or to solve any particular doubt asked by the participant.

The facilities provided by participant interface to students in our project are:

When a participant joins the session, they can view the presentation, which are conducted by the presenter in the virtual classroom. The presentation may include the PowerPoint presentation slides or it may also include the snap of the whiteboard on which the presenter can explain the concepts to the participants.

- Public/Private Chat - The participants can have a conversation with the fellow participants.

Now this template is connected with the database. Student or the client side programmer can register himself/herself for accessing the database or the files uploaded at the server side. If its login name and password is correct only then he/she will be able to access the database i.e. only after that list of available courses will be there. As soon as he/she selects the course he/she want to attend, they will be provided with the required lecture.

6. Results: As given in system specification, we have implemented most of the functionalities of the proposed virtual classroom. A presenter can add new users to session, he can create agenda for the session, that will give an outline about the session, he can add various resources (i.e. files or web links) to the session, he can show power point presentation to participants, also he can use white board, he can answer participants doubts using chat facility, he can create different poll questions. When participant enters in classroom, he can attend the session. He is able to download the resources submitted by presenter, he can chat with other participants in classroom, he can answer the polls, and also he can see the responses submitted by participants to those polls, he can view the slide transition, whiteboard.

7. Conclusion: When used as a teaching tool to supplement the traditional classroom, elements of the virtual classroom can indeed be beneficial to both students and teachers. There are benefits to teaching and learning via a virtual classroom tool as well as the traditional method. So, rather than choose one over the other, it is recommended to combine the best aspects of each in order to create a setting which is most conducive for students learning how to think and write.

8. Future Work and Limitations: The future of virtual learning environments has many innovative and exciting possibilities. The virtual classroom developed is quite useful in many aspects. Through this, seminars can be conducted on the Internet and participants from all over world can attend it. Though this is currently usable, it can be improved in many dimensions. As stated in proposed system's scope, the session will have facility of using real time audio. But since we couldn't do it, this part could be done in future.

For using the system, users must be trained properly. For that a user manual for the system need to be prepared, which will guide the user. Since it is not prepared, it can be done in future. Also, as we have seen many others virtual classroom has functionalities for session recording, breakout rooms etc. But, we haven't given such facilities in our

classroom. These functionalities can be considered as a further work to be done for our classroom. We are planning to do a formal evaluation of our system before opening it for public. This application can further be programmed to use internet for transmitting video, messages and PowerPoint presentations. As we have developed this application to work in local networks, it can be further upgraded to work when web server is introduced.

9. References:

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