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An Intelligent Webinar System

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Abstract

Webinar is the short for Web-*based sem*inar; a webinar is a presentation, lecture, workshop or seminar that is transmitted over the Web using *video conferencing software*. It is an advanced learning tool that allows students to communicate with the experts in real time over the network.[4] There are various benefits using virtual classroom such as optimized cost, distance learning, and flexibility to access material anytime anywhere. Now a day's using computer technologies to complement and support the collaborative learning has become one of the development trends of modern teaching and learning. In past few years, the way this technology has evolved and benefited the people is tremendous. The 21st-century students are technology savvy and want interactive learning and immediate access to information. They have a short attention span and want a facilitator rather than a teacher to help them learn. These webinars covered a wide range of topics from Technical, Soft-Skills, Languages, Effective English, Quality and Domain areas. These webinar sessions delivered by subject matter experts are recorded and re-use later. These webinar sessions are reproduced and edited in such a manner that

they can be used later on by students and colleges. In this paper, we present an intelligent webinar system for students or colleges. This system will help the students by proving great facilities like whiteboard, video broadcasting, screen sharing, separate call feature, chat system. It also has an intelligent BOT which will help the students in clearing their doubts in absence of Experts. It also has a text summarization system which works on data mining technology and will create the summary of every document uploaded by the experts to reduce the time of the students in reading long documents. And several new algorithms has been designed for searching and displaying the most trending webinars.

Keywords: Webinar, levenshtein, raddit, Websocket, Webrtc, Artificial Intelligence, Data Mining, Text Summarization, Long Polling, Whiteboard, PHP, Nodejs, e-learning, collaborative learning.

I. INTRODUCTION

The words 'Webinar' is a combination of 'web + seminar' which simply means a seminar over the internet. This software is a combination of technological innovation with intelligence which helps people to come together and collaborate effectively over the internet. This helps the sessions to be live and interactive learning experiences. Contrasting with a webcast, where there the communication flow is one-way[1], this offers a two-way communication leading to greater efficiency and participation by the audience. In this system every user has to log on to an internet site and be a part of the presentation or seminar. Webinars have been primarily used by business houses in the past but it has recently found way into the area of Education. Webinars are all set to bring a revolution in the Education sector. Offering global reach, these offer a mix of audio, video, text and other forms of live interaction

The key feature of a webinar is the ability to discuss and share information. Bringing experts to interact with students through this virtual collaborative platform, webinars offer an edge above the other modes of training. Some more features of webinars are discussed below:

II. RELATED WORK

Main features of a webinar can be listed as below:

- Search: - This is the feature given to search among the existing webinars. This search works under an algorithm which will automatically predict the word you are trying to search if you are writing the wrong spelling or word.

- Display: - This shows all the webinars present in the system But in the decreasing order of most trending and popular once along with your area of interest.
- Video: - This feature will help to broadcast audio and video using web socket, The main function in this component is multiple video conferences. WebRTC [2] supports only two peers to sharing conference. In order to support multiple or more than two peers, we need to apply some algorithms.
- Application Sharing: – It allows presenters to share their desktops, applications, etc to help the audience get a better understanding of the topic.
- Chat - The platform of webinar offers the students to ask their queries during the session without disturbing the flow of the session.
    - The feature of Chat helps in the following:
    - Interaction with the presenters privately
    - Interaction with the panel lists privately
    - Interaction with other participants privately
- Recording the presentation: – It may be worthwhile to record the session delivered by the presenter and re-use later.

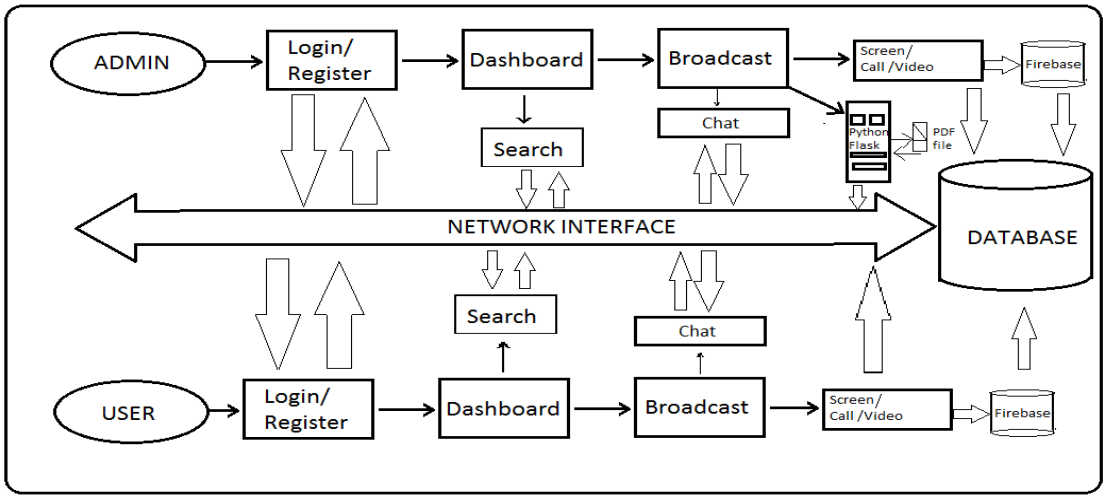

Fig. 1: Architecture of the system

- Whiteboard: - This feature will help the experts to draw graphs etc i.e. will give the feel of the classroom.
- File Summarization: - This feature will create the summary of the uploaded files and will help the students to learn quickly.
- AI BOT : - This feature will help the users to clear their doubts even the expect is not available.

The Fig 1 shown above shows the architecture of the system in which user or admin will have to login to the portal and then it will reach the dashboard where they can uses all the features.

This system is using mysql database to store all the data flowing through the system and firebase for real time media flow.

In this paper, we present new approach of online learning called intelligent web-based interactive virtual classroom that allows students and instructors to communicate within video conferences. Equipped with various systems that general virtual classroom must have including presentation tools, online whiteboard, real-time video and screen sharing. There are more outstanding interactive features such as quiz system, group system, and be able to extend as we create framework for easily generate real-time participation tools.

III. LITERATURE SURVEY

Webinar is an advance learning tools that allows students to communicate with experts in real time over the network.

The key feature of a webinar is the ability to discuss and share information. Bringing experts to interact with students through this platform, to increase their knowledge.

Before the introduction to Webinars, Subject experts were travelling to the colleges. This put a limitation on the number of colleges that can be covered, thus the coverage percentage have decreased from 22.18% to 18.53%. But after the webinar system gets introduced, worldwide reach of Webinars percentage has increased from 22.18% to 57.22%, an increase of 35.04% in coverage of colleges. This coverage has further increased to 40% covering almost each Campus Connect Partner Colleges. [1] This leads to the huge evolution and development in the field of education. Introduction of webinars reduces the cost of education as students can learn from any expert from anywhere in the world without spending much, the SME travel time is another major benefit. These webinars also covered a wide range of topics from Technical, English and Domain areas. These webinar sessions delivered by SME are recorded and re-use later which is also helpful in reducing cost.

Now we will be explaining about the evolution of the webinar and the difference between the existing and the proposed one. In 1991, Deshpande [9] showed first research about a virtual classroom multimedia for e-learning system including online video conferencing. But the limitations it had was unable to broadcast to multiple people at a time.

Then Back in 1996, Sankar [10] introduced video conferencing based projects to supplement lectures in teaching a graduate level telecommunication management course. But this system was just limited to video broadcast and suffered in creating the whole experience of virtual classroom effect.

Further in Thailand, Surachai [8] showed the real-time classroom system with two-way communication for e-learning in 2006. But in all these systems a lot of things

were missing which could make it a perfect experience of the classroom.

Thus we have proposed a solution in this paper to provide students a better classroom experience. This system is developed will one to many video broadcast facilities. This system also enables browser-to-browser applications for voice calling, video chat, text chat, file sharing [2]. Application sharing is also one of the important features provided to give the presentations. To create an educational classroom atmosphere a whiteboard has been provide so that the experts can write on it to explain any calculations or diagrams.

As we observed the current state of online learning from various software, we found that most of the problem is about "low interaction" between students and instructors.

In this paper as discussed we have tried to give the solution for a virtual classroom system. Further we added intelligence and machine learning to this system to provide a real time solution of the inactiveness of the experts. As we develop a text summarization system to create the summary of the file uploaded by the experts which will not only reduce the time of the students in reading long documents but also help them to understand fast.

We also have an intelligent chatting bot which will works when the experts are not available, this bot will provide the solutions for the problems mentioned by the students when the experts are not available. This bot will be trained automatically as it is connected with the real world of internet.

IV. IMPLEMENTATION

We designed the application based on system model. The system mainly implements between client side and server side. The module program is a collection of features and interactive tool which are controlled by module operation and can be extended as various functions.

This software is developed based on lava Script language in both client and server side. We apply JQuery as common library to develop Java Script along with HTML and CSS.

A. Searching

The searching algorithm states that the distance between two words is the minimum number of single-character edits (i.e. insertion, deletions or substitutions) required to change one word into the other. Adding to this if the search result is getting inefficient the sql Like command will be merged will the algorithm to give the better result.

B. Display

Display algorithm has been developed to populate the most trending webinars and having same as an area of interest.

SELECT * FROM webinar ORDER BY LOG10(ABS(participants - notattended) + 1) * SIGN(participants - notattended) + (UNIX_TIMESTAMP(created) /300000) DESC LIMIT 100

And after getting the result through this algorithm we implement a profile based search to give the best result.

C. Text Summarization

Text Summarization works on Python server (FLASK) with different port. When the file is uploaded it is first connected with the database and after that is sent to the flask server where the text are extracted from the file.

Bold keyword are given priority, Frequency of the words are taken care of.

```
def summarize(self, text, title, source, category):
    sentences = self.parser.splitSentences(text)
    titleWords = self.parser.removePunctations(title)
    titleWords = self.parser.splitWords(title)
    (keywords, wordCount) = self.parser.getKeywords(text)

    topKeywords = self.getTopKeywords(keywords[:10],
wordCount, source, category)

    result = self.computeScore(sentences, titleWords,
topKeywords)
    result = self.sortScore(result)

    return result

def getTopKeywords(self, keywords, wordCount, source,
category):
    # Add getting top keywords in the database here
    for keyword in keywords:
        articleScore = 1.0 * keyword['count'] / wordCount
        keyword['totalScore'] = articleScore * 1.5

    return keywords
```

Fig. 2: Sample Code to implement text summarization

D. Media, Application Sharing

The transmission of data and media file is established in client side by supporting API. In addition, WebRTC API is used to create video conference function[2]. The exchange of data in application is shown in session description via the main server and client server. JSON is common data format exchanging between client and server.

E. Whiteboard

Whiteboard a feature developed to provide a perfect environment to match a classroom. Node js at server side creates a web server which responds on separate port and whenever any expert draws anything will create a room and students present in that room can see the objects drawn on the whiteboard.

```
var express = require("express");
var app = express();
var http = require("http").Server(app);
var io = require("socket.io")(http);

app.use("/js", express.static(__dirname + "/js"));


io.on("connection", function(socket) {
    // at this point a client has connected
    var rooms=0;
    socket.on('room', function(room) {
        socket.join(room);
        rooms = room;
    });

    socket.on("draw", function(data) {
    //  console.log(rooms);
        socket.broadcast.in(rooms).emit("draw", data);
        //socket.broadcast.emit("draw", data);
    });

    socket.on("draw begin path", function() {
        //console.log(rooms);

        socket.broadcast.in(rooms).emit("draw begin path");
        //socket.broadcast.emit("draw begin path");
    });
});

http.listen(3000, function() {
    console.log("Listening on port 3000");
});
```

Fig. 3: Sample Code to implement whiteboard

F. Chat

To implement chat system, Long Polling method is used whose architecture is shown in fig 4 in this HTTP long polling client polls the server requesting new information. The server holds the request open until new data is available. Once available, the server responds and sends the new information. When the client receives the new information, it immediately sends another request, and the operation is repeated. This effectively emulates a server push feature.

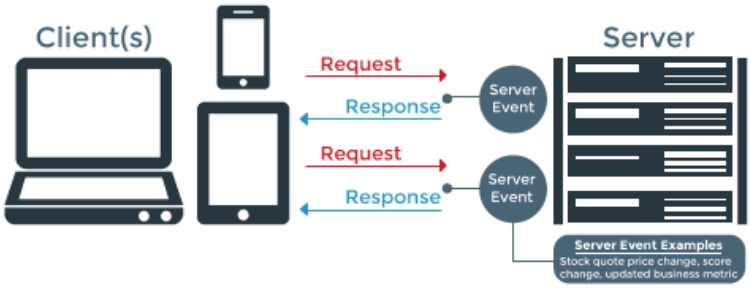

Fig. 4: Architecture of the chat system

G. AI BOT

This feature contains a combination of artificial intelligence and machine learning. AIML is used as a base language for the construction of the bot and python is the backend for this system which will help in machine learning, and creation of the AIML codes.

For the interface, HTML5 provides useful library such Expressjs (extended library of Node.js) which responds to website setting. Template and session management are introduced in Exprerssjs. Stylus also plays a major role as external language to enhance web-based design and application layout.

V. RESULTS

We first present the results of each function of application based on our latest experiment. Our result Fig 5 shows the admin screen.

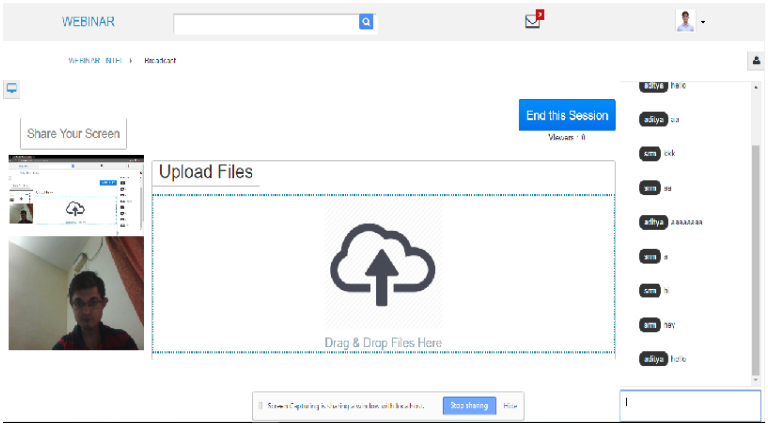

Fig. 5: Interface of the admin panel with chat, file upload

Where admin can start the webinar broadcast, share its application and at the right corner we have chat screen to contact members and ask doubts this functionality is

working with long polling method. Our result Fig 6 shows the Interface of web conference along with the whiteboard implementation working with separate nodejs server. Admin have to just click on the respective buttons to make these functionalities live and their respective access buttons will be displayed on the user side.

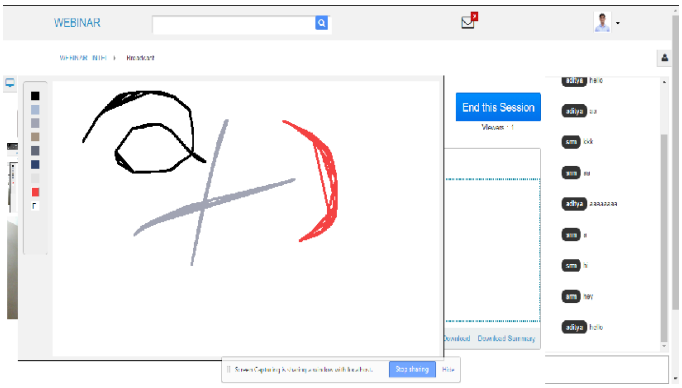

Fig. 6: Interface of web conference and whiteboard function

Our result Fig 7 shows the Interface of the dashboard where all the webinars events will be displayed according to the area of interest selected and the popularity of the events likes dislikes etc. This screen also contains a search box which helps to find the webinars even the user doesn't know the exact spelling of the webinar this algorithm implemented will be predicting the expected result and will be displayed with some variable results. This makes the approach very efficient and easy to access.

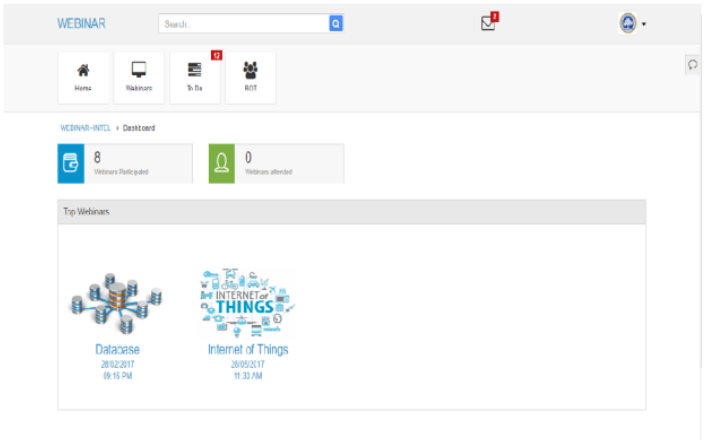

Fig. 7: Interface of the webinar dashboard

Our result Fig 8 shows the interface of the text summarization module along with the running python server. Admin has to just drag/drop the required document to the upload area, File will be uploaded in the directory and request will sent to the python server to execute the text summarization and save the separate summary file.

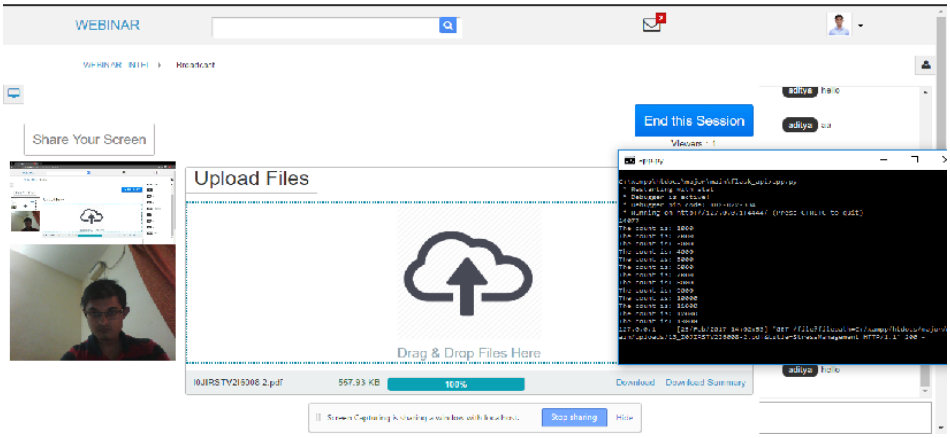

Fig. 8: Interface of file uploading and execution of text summarization

VI. CONCLUSION

This software is mainly designed to aim at the integration of an intelligent e-Learning experience and virtual classroom by applying additional interactive tools and intelligence. In discussion, our software can perform learning functions as we expected. The application provides satisfied results of current interaction and support in both PC machine and mobile. However, this software on mobile requires user to access application on web browser. In the future, we plan to improve interactive tool framework system and increase various useful participation tools to achieve goal of user engagement. Thus this tool will be very helpful in fulfilling the requirement of the current education system.

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