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The Utilization Video Conferencing Application for E-learning

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Abstract— **Video conversing services are widely used to bridge the long distance communications, which are executed at the same time. Various applications in the conference also experience growth, whether they are proprietary or open source. Both of them can be used in e-learning. Moodle LMS (Learning Management system) can be easily integrated with video conferencing applications or services, which can be utilized for e-learning process. This paper will present the results of the analysis of the utilization of BigBluebutton, Openmeeting and free streaming services from the students perspective as a user of the service.**

Keywords— **Video Conference, E-learning, Utilization**

I. INTRODUCTION

Video conferencing services are widely used to bridge the long distance communications by using internet technology. Provided by a better internet service, video conferencing technology utility are often conducted online. The online meeting is often conducted in business and education. In the survey, live-conference utility plays an important role. Furthermore, its role is getting more important. 41% of respondents (students) used video conferencing in their laptop or mobile phones for school activities, such as attending virtual classes or using distance learning services[1]. BigBlueButton is a technology which is based on an opensource system of opensource conferencing web. It can be used to share documents (PDF and office files), webcam, chatting, audio, and saving video documents of the conference results[2]. openmeeting is a project of Apache that can be used for video conferencing, instant messaging, document collaborating by using API function of Red5 Streaming Server for Remoting and Streaming[3].

Various choices in web conference are also developed, starting from proprietary to opensource. Both of them can be used in learning.

A. Research Objectives

The research is aimed to compare the performance of video conference application that is based on opensource (BigBluebutton and Openmeetings) and determine the students opinions as initial users in using the conference application (Bigblubtn and Openmeetings) in learning process.

B. Research Questions

1. Are the conference applications of BigBluebutton and Openmeetings able to handle the same number of users?
2. Do the students find it easy to use the video conference application (BigBluebutton and Openmeetings)?

C. Scope of the Study

This research compares the conference applications of BigBluebutton and Openmeetings in server by using processor, memory, and Linux Ubuntu operating system with the version of 14.04. There are 25 students who are suggested to be users. The research is also used to examine whether the applications are applicable for the initial users or not.

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II. LITERATURE REVIEW ON RELATED TOPIC

Video conversing services are widely used to bridge the long distance communications, which are executed at the same time. Various choices in web conference are also developed, starting from proprietary to opensource. Both of them can be used in learning. Moodle is a Learning Management System (LMS) software that is very popular in using conference technology to be integrated in online-based learning. Moodle facilitates all learning needs to be more simple and applicable [4][5].

Video conferencing is a synchronized technology of communication in audio and video where people can see and speak to other people from two locations or separated places [6]. Video conference is distributed by using internet network that enables a simultaneous and collaborative exchange of audio and video. Video is transferred by using nircable and cable. The video can be emitted directly and indirectly. The video can be used in distance learning by listening the speech live, known as streaming or by downloading files from the server [7].

There are some software that are based on close source (proprietary) and opensource (free) that can be used for learning process.

1. Close source (proprietary)
   a. Adobe connect : a software that is used to make information and general presentation, online training material, webconferencing, learning module, and sharing desktop user. This product is fully based on Adobe Flash.
   b. Zoom Video Communications: a software from http://zoom.us that can be used in video conference.
   c. Microsoft Skype for Business Server 2015 : a development of skype technology from Microsoft. This technology can be used for video conference.
2. Open Source
   a. BigBlueBttn: a web-based opensource that can be used to share documents (PDF and office foles), webcam, chatting, audio, and saving video of conference results.
   b. Openmeetings: a project of Apache that can be used for video conference, instant messaging, collaborating documents using API function of Red5 Streaming Server for Remoting and Streaming.

Video chatting is a new technology that can bridge the social interactions on screen as the media. Although video chatting only has two dimensions, it has live interaction feature. In addition, video chatting offers social interaction, even though eye contacts are limited [8]. The sense of touch, such as handshakes, hugs, touches, and physical contacts, is important in interpersonal communication. By using video chatting, it is possible for people to express and receive the sensation of intimate affection [9]. Video chatting can also be used in learning process. According to Kathy, video chatting can be functioned to train children in learning new vocabularies. [10].

Streaming is often used to broadcast live events of sport, music, news, and entertainment so that people can watch and listen to them directly. There are many free streaming services. Video is transferred using nircable and cable. In addition, the video is transmitted directly and indirectly. The video can be used for distance learning by listening to live speech, known as streaming. It can also be downloaded from the server [11]. By using video and audio, students can process the information faster. Furthermore, they can also understand the materials better [12]. Video and audio streaming can help the students to understand difficult concepts and procedures. Complex materials can be explained clearly using images and texts [13].

In order to fulfil its roles, video chatting requires high quality of services (QoS) so that packet loss, end-to-end delay and jitter can be avoided. The clasification of services by using QoS parameter has been fulfilled by the usage of video chatting via 3G [14].

Video conference can also be used in order to increase the intercultural communication skills of Sweden students. They can conduct

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the interview session with Chinese students using internet. They can also meet them in virtual class [15].

III. RESEARCH METHODOLOGY

The method used in this research is to compare the ability of conference services between BigBluebutton and Openmeetings. The comparison is based on the installation easiness, utilization easiness, and application display.

A. Research Methodology

The stages in this research are :

1. The installation of BigBluebutton and Openmeetings in the servers that have the same memory and processor. BigBluebutton and Openmeetings are installed in the server of IBM x3400 M3 Ref2 5U 2.66 GHz/5.86 4C that has the same memory and processor. Both applications are installed using Linux Ubuntu Operating System with 14.04 version.
2. The performance comparison of BigBluebutton and Openmeetings.
3. The application comparison of BigBluebutton and Openmeetings from the point of view of students.
4. The conclusion.

IV. IMPLEMENTATION

Openmeetings and BigBluebutton are installed in the servers with the same specifications. They have the same processor, memory, and network. The results of the installation of both applications are presented in the following images :

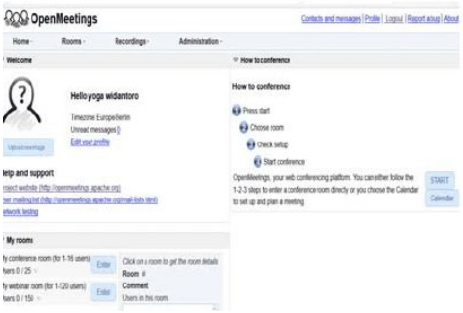

Fig. 1. The Image of Openmeetings

Fig. 2 The Image of BigBluebutton

The test on the students is conducted after both applications are installed in the servers. The test is conducted with 25 university students in the class. The students are 2016 freshmen.

The test is conducted in the class. Each student uses his/her own laptop. The laptops have varied specifications. The test uses internet network of Cisco Air SAP2602e Wifi that can handle 50 users simultaneously. The internet service uses internet access of 50 MBps share.

Test of Openmeetings and Bigblubtn

Openmeetings have several choices in conducting conference, such as public rooms and private rooms. When the start button is clicked, the conference service displays some options, such as Conference Room with micro option set Users 0/32, Public Conference Room, Users 0/32, Public Interview Room, Users 0/16, Public restricted Room, Users 0/100, Public Video and Whiteboard Room, Users 0 /32, Public Video Only Room 0/32, and Restricted Room with micro option set users 0/100.

In using Openmeetings, the user and group login needs to be made so that each user can log in in the same group. The user that firstly logs in is considered as a moderator. The moderator has different rights that other users. He or she can activate and nonactivate other users.

BigBluebutton does not need any login. Names of the users are entered and they will be automatically submitted in the video conference. The first user submitting his/her name will be the moderator of the group. There is no options in the menu display of BigBluebutton. The moderator can arrange

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the user traffic and the moderator can also delete the user that enters the traffic.

V. RESULTS

BigBluebutton and Openmeetings can be easily installed in the server of IBM x3400M3 with 8 GB RAM using Linux Ubuntu Operating System with 14.04 version.

Openmeetings and BigBluebutton can be used easily by initial users to conduct video conference because they have helpful menus.

By comparing the menus of both applications, Openmeetings is mostly chosen. Openmeetings provides more menus that can accomodate the needs of the users.

Even though Openmeetings can accomodate the users with its menus, the menus in BigBluebutton are easier to understand because BigBluebutton has a few menus and the position of the menu/button are easier to locate and use.

8,3% of the users choose BigBluebutton for its video quality and 75% of other users said that Bigblubtn has medium and even bad video quality. 66,7% of the users stated that Openmeetings has medium video quality. None of them said that it has good video quality.

41,7% of users said that BigBluebutton has good camera quality and 50% of others said that it has medium camera quality. No one said that Openmeetings has good camera quality. 50% of users stated that it has medium camera quality and 41,7% of them said that it has bad camera quality.

50% of users stated that Openmeetings has medium loading speed in accessing the video conference service and 41% of them said that it is very easy to load. 50% of the users said that BigBluebutton can be easily accessed and 33,3% of them said that it has medium loading speed. Other users stated that it is difficult to access in the server.

The students are asked to choose between those applications of video conference for the display of presentation and whiteboard. 66,7% of the users choose Bigblubtn and 25% of others choose Openmeetings.

The students are also asked to choose which application is better, BigBluebutton or Openmeetings. 75% of them choose BigBluebutton and 25% of them choose Openmeetings.

VI. CONCLUSION

The technology of BigBluebutton and Openmeetings can be easily installed in Linux Ubuntu Operating System. The technology depends on the hardware of the server used.

The number of users is not stable, 15 to 20 user can be active simultaneously.

The initial users can use both applications of video conference easily. BigBluebutton is mostly selected.

By using the server, the usage of video conference cannot be maximum if there are more than 10 students because the time delay will be longer.

VII. RECOMMENDATION

Both applications can be used as a learning model for video conference communication that can be integrated with e-learning application, for example LMS Moodle.

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