Smart and Simple Classroom Presentation Tools

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Abstract : 2011 was the beginning a new era of clouds based computing technology or who often called cloud computing, where there were some several providers who were quite popular namely Dropbox, google drive, icloud, and SkyDrive. Along with the rapid progress in cloud technology, this could be used as a solution to the institution for the dissemination of presentation material without having dependence about the limitation of storage media, must always be brought, and could be accessed anytime and anywhere. In this research develop presentation application based on cloud infrastructure and cloud storage to store the presentation material. And for the cloud server used small CPU namely Raspberry Pi, and for client CPU at the classroom used the same device. To access the presentation application or accessing the presentation material both lecturers and students could use a laptop, smartphone, tablet, or Raspberry client in the classroom, as long as connected to the network. The application developed with HTML 5 programming language and cloud server with Raspbian Jessie operating system. And for cloud system used Owncloud for easy management. And for implementation, this research result would be implemented at Informatics Management Diploma Department of Merdeka Madiun University.

Keywords: Cloud Computing, Computer Network, Raspberry, Classroom, Presentation.

I. INTRODUCTION

2011 was the beginning a new era technology computing clouds or who often called cloud computing, where there were some several providers who was quite popular namely Dropbox, Google drive, icloud, and SkyDrive [1]. Along with the rapid progress the internet technology, a storage medium online digital known as cloud storage. It has become popular.Indonesians as user spoiled by cloud service that can be accessed anywhere and anytime, for the service users could increase and decrease the use of computing resources and services easily and flexible. Users no need to make investment large enough to computing resources, storage medium, and the cost of care for system management, network, and the database [2].

It is also felt by the company or institution that runs its core business is no longer based on a local server or remote server. Company or institution also has the capability to provide data center services as well as Internet companies, so as to provide their services according to the needs of data storage [3][4]. On the other hand, especially in urban life, cause a shift in behavior that causes global life patterns which encourage people to use cloud services to share and collaborate [5].

As the advancement of information technology and communication, media communication between faculty and students also progressively. Besides face-to-face communication, lecturer and students also could interact through email, mailing list, social media, or sending short message service. Easy access to the internet makes the communication between faculty and students can be done by internet based media. So it was necessary developed a presentation tools that can be accessed wherever and anytime using network connection, that would give ease in the process of the dissemination of material presentation without having to having dependence with a limited storage medium and must always be brought and, could be accessed anytime and anywhere.

In classroom sometimes lecturer forget to brought storage media which consist of lecturing material, or do not bring own laptop or laptop itself. So we need tools that could be used by a lecturer in the class where it just needs a network connection and browser. Now there was a small CPU that could be used as server or PC that located at classroom without need a very large space,

and it was a Raspberry. The presentation tool could be installed at the server using raspberry and we could provide the computer in the classroom using Raspberry.

II. LITERATURE REVIEW

Cloud Computing was a new concept of the information technology implementation, where cloud computing used as a medium to provide media savings and an application that accessible through a computer network with centralized data center [6]. And some big companies had developed and applied this technology, they were Amazon , Microsoft , and Google [7]. There were three model of cloud computing services, it was infrastructure as a service (iaas), platform as a service (paas) , and software as a service (saas) [8], whereby on that three model users did not participate in managing and check to network infrastructure, server, operating system, storage media, or applications were used.

On the services of software as a service (saas) users do not have to buy the application, but fairly to hire or pay per use model as a charge of service. Platform as a service (paas) vendor as a service provider gave development support to application developers, who developed the applications and provide services through providers platform. Service providers develop toolkit and standards of application development, and channel for the payment and distribution. Providers receive payment as the platform provider, sales and the service distribution. This speed up the propagation of application software with low cost and the use of the channel that has been developed to serve customers demand. Infrastructure as a service (iaas), vendor providers provide infrastructure to run applications, With pay per use payment model and give services in accordance customers required. Providers could build infrastructure that serves the top demand and adds more capacity in accordance customers need. Customers pay according to needed resources, the size of data storage [9].

There was four model implementation of computing clouds, and it was private cloud, the community cloud, public cloud, and hybrid cloud. When cloud infrastructure owned by an organization and limit the user's access to the application by using firewall it was called as a personal cloud. But when an organization was providing cloud services to a community certain having the same purpose with an organization and in order to in support of the main objective of the organization, so it was called as a community

cloud. And cloud services provide for the user without a specific purpose and managed by an organization that aims to give cloud services whether free or paid so it is called as a public cloud, while for the combination of some cloud service called as a hybrid cloud. Where to combine some cloud service needed a cooperation standard.

There were five big primary challenge and must be concerned with the implementation of cloud computing, and it was security, interoperability, availability, performance, data and migration. Security focuses on the privacy of data stored on the cloud services, secrecy, and network traffic separation through a subdivision access. While interopability providing easy services, and offered some service option choice needed by the user. The availability and performance guarantee that the service was always ready to used by the user whenever when it comes to used. And the last problem was data and ability to perform data migration between cloud services until now this would be the greatest challenges that must be completed [6].

Some unique features and computing technology advantage was multitenancy or shared resources based on the business model where the resources used together with some users in the same resources at the network level, users level, and the application level. Massive scalability, even the organization may have hundreds or thousands of system, cloud computing had performance until tens of millions system, in addition to the ability to use a large scale of wide band and data storage. Elasticity, users able to quickly increase or decrease computing resources, and release resources to other use if no longer needed. Pay as you go, users only pay used resources and only on time when they need. Self-provisioning of resources, resources that were own by the user, as these systems had the additional ability of processing, software, data storage, and network [9].

Multimedia learning based could be packaged to be multimedia learning presentation media. A presentation was one of communication form, as an activity to the submission of a topic, opinion, or information of others. In a presentation, there were some essential elements, (1) a party who do the presentation, (2) presentation participants or audience, and (3) the media or presentation device. Learning presentation media was an intermediate that provide or convey a message that helps lecturer in lecture activity, not replace the lecturer's roles overall but can convey a message effectively and efficiently.

Multimedia is a combination of different forms of digital media, like text, picture, sound, and video, to integrated multisense interactive application or presentation to deliver messages or information to the audience. In any combination or permutations of standard media format, a whole must be greater than the number of parts. Multimedia had potential to expand the number and kind of available information to students. In previous studies have many researchers developed applications who use multimedia, as practiced by Budiman [10] [11] and Mulyawan [12]. Where in their research developed a multimedia learning based application that could help users to understand learning matter.

For example, online encyclopedia could provide links to video and an additional article about particularly interesting topic. News stories could reference links to comment audio, replay a video, and the additional link to the website resources. Online instruction could include the explanation, links to resources, simulation, illustration and photos, and types of activities that can also include several media.

Mayer [13] explained how we process information through two primary channels, verbal and visual. Many people assume multimedia is of course better because using both channels. Researchers have found that multimedia help a person learn easier because it was easier in learning preference. Several media could be used to take advantage, the fact that our brains access information by means of nonlinear. Although multimedia could provide opportunities to increased learning, could be more effective , even harmful if implemented badly.

A personal computers (PC) considered as multimedia PC if the PC drive have a cd-ROM or DVD recording supports and audio playback in 16-bit wave, sound synthesis, the appearance of MPEG moving pictures, with fast enough central processor and considerable of RAM size which mean able to play and to interact with those media in real time, and with large hard disk to store the result of multimedia creation.

III. DEVELOPMENT METHOD

In this research, we used Research and Develop method, wherein this research focused on the application development and the implementation application. This method had six stage that recently used by Ariesto [14] and Budiman [10]. Where the six stage were concept, design, material collecting, assembly, testing, and distribution.

Concept, at this stage we arranged and performed the application development concept, begin by doing literature study from previous research and then concluding problems relating to presentation media.

Design, after a problems analysis about presentation media then arranged the design of cloud-based presentation application. At this stage designed how infrastructure, implementation and application display interface in this research the infrastructure implemented at Merdeka Madiun University network. Where the application could be accessed from classroom or wifi hotspot.

Material Collecting, after had the application design and understanding the network infrastructure the next step is to make the acquisition of presentation items to be used as sample on the application developed. The presentation material would be create using the presentation application build and then share the file in repository server, where file format was in JSON file format.

Assembly, when design and material collecting were completed the next step is to do a compilation of the presentation material into the presentation application. And then both the presentation application and presentation material were uploaded into the cloud server. For the presentation material would be stored in owncloud server for easy management.

Testing, after the application and presentation material were finished to upload into the cloud server the next stage was testing the application which has been developed in the previous stage. In this testing stage, we were using Blackbox method, where we were testing the input and output of the application. In this testing we would check to create a presentation and then export it and store it in the cloud server, then we tried to import back the presentation material into the application.

Distribution, when the results of the testing stage have announced eligible, so the next stage was to distribute the application which has been developed. So that application could be used by lecturers and students for the learning activity.

IV. RESULT AND DISCUSSION

The presentation application developed by using open source platform namely strut, where strut itself was a development of the impress.js platform. The programming language used for the application development was HTML 5, CSS, and javascript. In the implementation, presentation application would be opened through a browser with access to the server IP address. On the developed application main page filled with information about tutorials how to use the presentation application. And on the other page would be filled with tools to create and presentate presentation.

Figure 1. Application Main Page

In figure 1 shown the interface of the application main page, wherein the main page user would be shown how to create, export, import, and presentate like illustrated in figure 2.
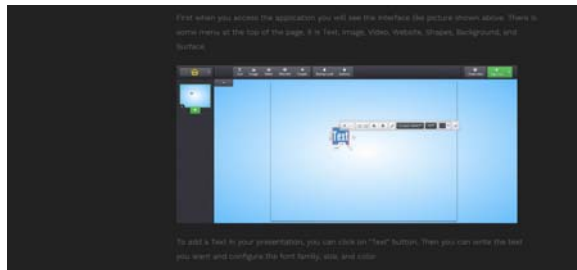

Figure 2. Application Tutorial

If the user did not want to read the tutorial first, so the user could click the shortcut on the main page to get through to the main presentation application like shown in figure 3.

Figure 3. Presentation Maker.

In the main presentation application main page there was view menus on the toolbar, which it was the primary function of the application. Users could add text, image, video, website link, shapes, changing the background color, and changing surface color. Users also could create a new presentation file just like using other common presentation application like Prezi.

In this research, the server hardware used a raspberry pi device, in which the use of raspberry pi could save the energy costs and very save electricity resources.Raspberry pi was a slight computer with having some function. The raspberry pi used in this research operated using Raspbian operating system. The raspberry specification was arm 11 processor with 700mhz speed. There was 2 type of raspberry pi it were A and B type, the differences from those type been was the memory size where A type memory size was 256 Mb and B type memory was 512 Mb. As a storage media raspberry pi use memory card used to store data or operating system used. To connect with the monitor screen, the raspberry used HDMI connectors, while for the network connection used LAN port. But in this research used wifi dongle device which mounted on USB port, so it will minimize the use of network cable. For the electrical power source raspberry pi needs supply of

5 volts with a current of at least 700ma for B type and 500ma for A type [15].

To run the developed applications raspberry pi device we need to install local server service, in this research used light httpd, and for programming support language was PHP 5. For the operating system used raspbian Jessie that was the latest of raspbian operating system. While for storage media used a micro SD card with 16 Gb capacity and 10th class to get faster data rate transfer. Then the raspberry server device would be connected to the university network infrastructure using LAN port just like shown in figure 4, and for the raspberry client at the classroom connected using wifi device.

Figure 4. Raspberry Pi Server.

Figure 5. Raspberry Pi Server Connection Test.

In figure 5 shown the results of connection testing from laptop to the Raspberry server through the network. Then the presentation application which it was installed on the Raspberry server raspberry accessed using the laptop connected to the network. And the result, presentation application could be accessed and used online through the network system.

After testing the server connection then we were doing server connection from the classroom, where in the classroom provide with raspberry pi as a client PC and connected both to the network infrastructure and LCD projector. For the Raspberry client the operating system provides with browser and word editor tools, just in case if lecturers or students would like to create some notes in the lecture activity. To get access to the application users must open the browser and then the browser would be automatically forward to the application through the application server. To get the presentation material users could type the IP address of the cloud application then login in to the cloud like in figure 6 and download the material. After downloading the material then import it into the presentation application.
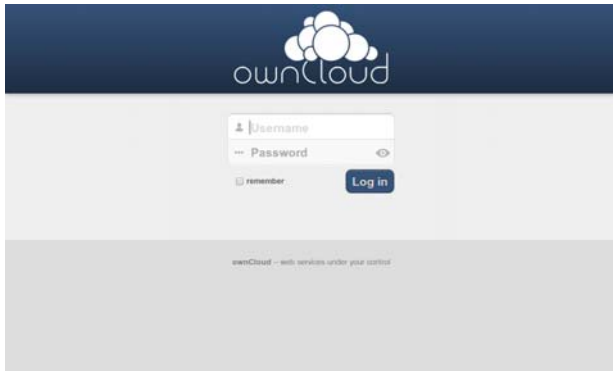
Figure 6. Cloud Login.

In figure 6 shown the login page of cloud application, where the users need to login first before access the presentation material. After login to the cloud storage, users could choose which lecture material would like to download and opened with the presentation application like shown in figure 7.
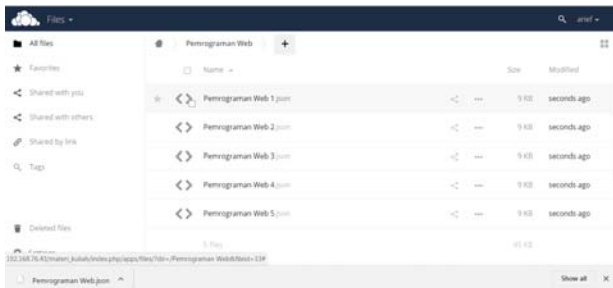

Figure 7. Lecture Material

After chose and downloaded the lecture material which is in JSON file format, then users could import it into the application from the import menu like shown in figure 8

Figure 8. Importing Presentation Material.

After importing the JSON file, the presentation would be shown like in figure 9, where users could read and modified the presentation.

Figure 9. Opened Presentation.

If wanted, users could save the presentation file into the application where the presentation would save in the browser cache. So for next time user do not need to access the cloud storage if want to access the previous presentation files. On the other hand, the presentation could export back into JSON file if users wanted to open it again in another device. For the classroom, implementation could see in figure 10, where the presentation shown on the projector screen from the Raspberry client.

Figure 10. Classroom Implementation.

The application could use by lecturer in lecture activity, in this case the lecturer do not need to bring any laptop or storage media. The lecturer just came into the classroom and access the presentation material from Raspberry Client and get the presentation from the cloud storage.

V. CONCLUSION

After the testing stage was completed, where the results showed that the Rasberry server for the presentation application and cloud storage server were running successfully. Users could access the application from several devices like laptop, PC, smartphone, and tablet from the wifi network infrastructure Including access to the cloud application. For the implementation of lecture activity, where in the classroom provide with Raspberry client that used to access the application were successfully implemented.

So from this research we could conclude as follows, the cloud presentation for smart and simple presentation tools were successfully built and implemented in lecture activity at Informatics Management Departement at Merdeka Madiun University through the network.

VI. AKCNOWLEDGEMENT

VII. REFERENCES

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