Operating System Development Based on Open Source Software in Online Learning Systems

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Abstract—During the Covid-19 pandemic, all learning activities were carried out online. Many learning media and software are used in online learning. The purpose of this study is to develop online-based applications for the learning system. One of them is the Open Source Operating System which is currently widely used in online learning systems. This makes the operating system much attention by the world of education, researchers, government organizations, individuals, even large software companies such as Google and others who are very interested in developing Open Source software, especially the Linux Operating System. This makes the authors interested in knowing how to develop an operating system based on open source software in online learning systems and disseminate the use of open source software to the public.

Keywords—Open Source Software, Online Learning

I. INTRODUCTION

The operating system at this time continues to be used in big companies and education. However, there are still many people who hesitate to use the Linux operating system, and still choose to stick to Microsoft (Windows) because they are more familiar with the OS. P adal they are not aware if they're using the OS is pirated. They are reluctant to use Linux because the Linux application installation process must be connected to an internet connection. By using pirated software, of course it is very contrary to the campaign for HAKI (Intellectual Property Rights) Law No. 19 of 2002 on copyright, SE Bareskrim Polri No.B / 2/08 / XI / 2008 will be subject to a 5 year prison sentence or a fine of 500 million if using pirated software and the statement of the MUI fatwa No.1 / Munas VII / MUI / 15/2005, explaining that piracy is haram[1].

It is therefore necessary legal operating system and application installation without having to connect the internet. P device may open source software does not simply replace the software licenses are expensive but also legal. This software is also very helpful for users to innovate program codes, so that they can be developed into various applications according to user needs. Currently, a number of activists and enthusiasts of open source gathered in the Free / Open Source Software (FOSS) Conference and Training Camp Asia Source II and produced 6 ready-to-use solutions that can be used by the public for free. The six solutions include solutions for small and medium enterprises (SMEs), non-governmental organizations (NGOs), security systems, audio video processing, open publishing for public journalism, and campuses for managing training [2]. In December 2006, a desktop application based on the open source “IGOS Nusantara 2006” was launched. IGOS Nusantara 2006 is a Linux Fedora Core 5 derivative software equipped with open office office applications, GIMP graphics management application, Firefox for browsing, Thunderbird for e-mail, and GAIM for chatting[2].

OSS software is currently also often used in the world of education for online learning in the era of the Covid-19 pandemic. Online learning is carried out using a computer device or Gadg et. So, communication or the learning process can still run between students and lecturers or students and teachers. The use of information technology is expected to be able to overcome the teaching and learning process so that it can continue to run well even though it is currently in the middle of the Corona Covid-19 Virus pandemic. As a result of this online learning, internet users in Indonesia increased by around 17 percent or 25 million users. And today there beber what information technology can be used as a learning medium in tandem with mengunakane-learning. E-learning is an innovation that can be utilized in the process of learning, not only in penjam to achieving pembelajaran material but also a change in the ability of the various competencies dime ta learners. Through e-learning, learners are not only men listen to a description of material from the pen of students but also actively observe, perform, demonstrate, and so on. Teaching materials can be virtualized in various forms so that they are more interesting and more dynamic so that they can motivate students to be further in the learning process. Based on the above explanation, the authors aimed to determine (1) cara operating system development based on open source software in the online learning system and (2) to disseminate the use of open source software to the community[4].

II. RESEARCH METHODS

In this study, it was carried out through a two-stage approach, namely the observation approach and literature study. This is done for data collection, air in order to complete the study, while the research methods used in conducting the study as follows:
2.1 Observation Method
The author studies the problems that exist in the field that are closely related to the object under study, namely the use of information technology in online learning through questionnaires to obtain data so that it can be processed in the discussion of this study.

2.2 Literature Study Method
In this case the researcher gets data sources from various sources by collecting supporting references through books, journals, magazines and other sources that support research, this method is used in collecting related data.

III. RESULT AND ANALYSIS
The open source software online learning system was developed using Moodle's content management system (CMS). While Apache is used as a web server and MySQL as the database. Users of this system include administrators, course creators, teachers, students and guests. The initial view of the system can be seen in Figure 1.

![Initial view of the OSS learning system](image1)

Figure 1. Initial view of the OSS learning system

Learning materials that have been developed in this system include Open office writer, Open office calc, Mozilla Firefox, LAMP server installation and application installation on Linux Fedora. All materials are developed based on open source. This is done in order to empower and disseminate open source software. All of this is a manifestation of the mandate of the IGOS declaration. The overall implementation of the learning material can be seen in Figure 2.

![OSS learning materials](image2)

Figure 2. OSS learning materials

Open Office Writer is a word processing application that is always needed in making activity proposals, correspondence, scientific articles, etc. The word processing material consists of 7 topics covering introduction, working with text, arranging pages, printing, graphics, tables and mail merges. In addition, it is also completed with pretest and posttest for each topic discussed. A complete view of the material can be seen in Figure 3.

![Open office calc learning materials](image3)

Figure 3. Open Office Calc learning materials

Mozilla Firefox is a browser application that is needed in searching for information on the internet. With a browser looking for information on the internet can be done easily, quickly and efficiently. The Mozilla Firefox material consists of 4 topics which include an introduction; Mozilla Firefox configuration; access the website; and Google search tips. The appearance of this material can be seen in Figure 5.

![Mozilla Firefox learning materials](image4)

Figure 4. Mozilla Firefox learning materials

Installing the LAMP server on Fedora core 6 is an installation process to build an Apache web server with MySQL database and script processing in the form of PHP on Linux Fedora core 6. This web server setup is very necessary to support application development using a web-based platform. The material provided consists of 5 topics which include an introduction; preparation of installation; Apache web server; MySQL and PHP database servers. The appearance of this material can be seen in Figure 6.

![LAMP server installation and application installation on Linux Fedora](image5)

Figure 5. LAMP server installation and application installation on Linux Fedora

Figure 6. LAMP server learning materials
The online learning system developed can handle online learning with open source software. Historical learning activities of students have also been recorded. Thus this system can be developed to be able to display student learning activities visually so that teachers can analyze or diagnose student learning problems. This system can also be developed to motivate students who are learning online, so that learning outcomes can be achieved more optimally. The final result of the research is to develop online-based learning projects.

REFERENCES


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