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

1st Agus Prasetya, 2nd Muqorobin, 3rd Farid Fitriyadi
1,2 Institut Teknologi Bisnis AAS Indonesia Surakarta
3 Universitas Sahid Surakarta
1,2 Jl. Slamet Riyadi No. 361 Windan, Makamhaji, Kartasura, Sukoharjo, Indonesia
3 Jl Adi Sucipto No 154 Jajar Surakarta
1 agusprazetya123@gmail.com, 2 robbyaullah@gmail.com, 3 faridfitriyadi@gmail.com

*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 continue b erkembang by leaps and bounds . K hususnya on the Linux operating system is open source that is widely used by 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 adahal 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 connection i nternet. 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 d iantaranya with menggunakane-learning. E-learning is an innovation that can be utilized in the pro ses learning, not only in penyam to achieving pembelajara 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) c ara 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.
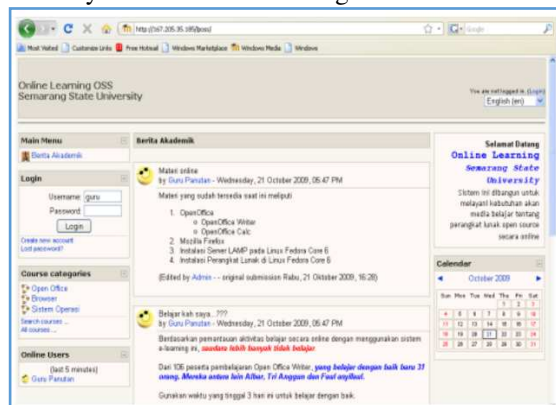


Figure 1. Initial view of the oss learning system

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.
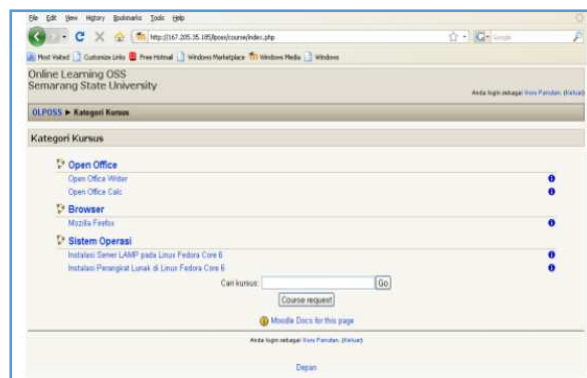


Figure 2 . OSS learning materials

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.



Figure 4 . 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.



Figure 5. 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 webbased 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.

Figure 6. Installing LAMP Fedora core 6

Installing applications on fedora core 6 is an installation process to place an application program on linux fedora core 6. This installation needs to be done because it meets the application demands required by the user. The material provided in this lesson consists of 7 topics covering the installation method; shell commands; create a local repository; program installation; font installation; installation using RPM and installation using source code. A complete view of the material can be seen in Figure 7.



Figure 6 . Software installation on fedora core 6

## IV.CONCLUSION

The result of this research is an open source software online learning system. The open source software online learning system was developed on a web basis and has been placed on the Poss Unnes server, so this learning system can be accessed via the internet network. The learning materials developed include Open office Writer, Open Office Calc, Mozilla Firefox, Installing the LAMP server on Linux Fedora, and installing applications on Linux Fedora. Learning materials in this system can be used for empowerment and dissemination of the use of open source software throughout Indonesia. Users of this learning system include administrators, course creators, teachers, and students. Each of them has the authority in accordance with their respective duties. Administrators are tasked with managing the online learning system. The course creator is in charge of creating courses and plotting the teachers who will teach them. The teacher is in charge of constructing the learning content which is their responsibility. Meanwhile students are students who learn using an open source software learning system.

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

[1]   Muqorobin, M., & Rais, N. A. R. (2020). Analysis of the Role of Information Systems Technology in Lecture Learning during the Corona Virus Pandemic. International Journal of Computer and Information System (IJCIS), 1(2).

[2]   Muqorobin, M., Kusrini, K., Rokhmah, S., & Muslihah, I. (2020). Estimation System For Late Payment Of School Tuition Fees. *International Journal of Computer and Information System (IJCIS)*, *1*(1).

[3]   Solihin, Ahmad, MySQL 5 From Beginner to Advanced, Achmatim.      net.      Jakarta. https://www.firebase.com/features.html, accessed September 26, 2015.

[5]   Muqorobin, M., Rokhmah, S., Muslihah, I., & Rais, N. A. R. (2020). Classification of Community Complaints Against Public Services on Twitter. International Journal of Computer and Information System (IJCIS), 1(1).

[6]   Muqorobin, M., & Rais, N. A. R. (2020, November). ANALISIS PERAN TEKNOLOGI SISTEM INFORMASI DALAM PEMBELAJARAN KULIAH DIMASA PANDEMI VIRUS CORONA. In *Prosiding Seminar Nasional & Call for Paper STIE AAS* (pp. 157-168).

[7]   Utomo, I. C., Rokhmah, S., & Muslihah, I. (2020). Web Based Distribution of Zakat, Infaq, and shodaqoh (Case Study Of Surakarta City Region). International Journal of Computer and Information System (IJCIS), 1(1).

[8]   K. Kusrini, E. T. Luthfi, M. Muqorobin and R. W. Abdullah, "Comparison of Naive Bayes and K-NN Method on Tuition Fee Payment Overdue Prediction," 2019 4th International Conference on Information Technology, Information Systems and Electrical Engineering (ICITISEE), Yogyakarta, Indonesia, 2019, pp. 125-130, doi: 10.1109/ICITISEE48480.2019.9003782.

[9]   Ngatmono, D., Riasti, B, K., & Sasongko , D., 201 5, Building an Independent Operating System

[10]  Based on Ope n Source with Remaster Method, Indonesian Journal on Networking and Security, vol 4 , pp. 39-47.

[11]  Djuniadi, Y., Primadiyono & Sutopo, Y., 2010, Implementation of Open Source Software Materials in Online Learning Systems, vol 27, pp 15-21.

[12]  Hendriadi & Heryana (2014), Development of Open Source-Based Operating Systems In Election Distribution Package

To Support kegiata n Academic Papers UNSIKA , vol 1, p 7-15.

[13] Muqorobin, M., Hisyam, Z., Mashuri, M., Hanafi, H., & Setiyantara, Y. (2019). Implementasi Network Intrusion Detection System (NIDS) Dalam Sistem Keamanan Open Cloud Computing. Majalah Ilmiah Bahari Jogja, 17(2), 1-9.

[14] Muqorobin, M., Apriliyani, A., & Kusrini, K. (2019). Sistem Pendukung Keputusan Penerimaan Beasiswa dengan Metode SAW. Respati, 14(1).

[15] Abdullah, Robi W., et al. "Keamanan Basis Data pada Perancangan Sistem Kepakaran Prestasi Sman Dikota Surakarta." Creative Communication and Innovative Technology Journal, vol. 12, no. 1, 2019, pp. 13-21.

[16] Saputra, R., & Rais, N. A. R. (2020). Online Sales System Analysis of PT. Nutrifood Indonesia through the distributor CV. Trio Sukses Mandiri Solo With Nutrimart Home Delivery (NHD) Application. International Journal of Computer and Information System (IJCIS), 1(2).

[17] Muslihah, I., Muqorobin, M., Rokhmah, S., & Rais, N. A. R. (2020). Texture Characteristic of Local Binary Pattern on Face Recognition with PROBABILISTIC LINEAR DISCRIMINANT ANALYSIS. *International Journal of Computer and Information System (IJCIS)*, *1*(1).

[18] Hikmah, I. N., & Muqorobin, M. (2020). Employee Payroll Information System On Company Web-Based Consultant Engineering Services. *International Journal of Computer and Information System (IJCIS)*, *1*(2).

[19] Nastura, S. A., & Muqorobin, M. (2020). Transaction Processing System Analysis Using The Distribution Management System (DMS) Nexsoft Distribution 6 (ND6). *International Journal of Computer and Information System (IJCIS)*, *1*(2).