

# DEVELOPMENT OF LINUX UBUNTU OPEN SOURCE DISTRIBUTION BASED OPEN SOURCE DISTRIBUTION SYSTEM TO MINIMIZE STUDENTS 'SOFTWARE STUDY

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**Abstract-**This study aims to develop The Zero-based Ubuntu Open Source Distribution Operating System to minimize software piracy among students. Distribution Zero Development is implemented on Ubuntu 18.04 Linux with pingu builder software, all functional requirements have been successfully implemented in accordance with the design. The planning used in this study is the development and use of the waterfall development model with stages, namely analysis, design, program making, program testing, implementation, to the stage of validity testing, practicality and effectiveness. The test was carried out using a validity questionnaire, practicality and user satisfaction questionnaire. The conclusion of the Zero Linux Ubuntu Open Source Distribution Operating System design is to make the Operating System easy to use by students so as to minimize software piracy among students.

**Keywords-***Operating System Development, Open Source Distribution Zero, Ubuntu Linux, Software Piracy*

## I. INTRODUCTION

### A. Background

In this era of globalization and information technology, a very rapid change in the field of information technology is a fact in life, especially education. The development of education in the field of knowledge about information technology is one of the keys to the success of capacity building in adapting to changes in the world of technology, including information technology [1]. Education also plays a very important role in ensuring the survival of the country and nation, because education is a vehicle for improving and developing the quality of human resources [2]. Operating System is one of the vital components in a computer system. The operating system is responsible for managing the use of computer hardware such as processors, memory, I / O devices, storage media, etc. In addition, the Operating System also functions as a layer that connects computer hardware with software [2]. The selection of the Operating System becomes very important, because the Operating System is a part of the system so that if it is to be formulated it means we must first understand how a system works [3]. Linux

is present in the world of information technology not only an Operating System, but also a trigger for the thought revolution in the software industry. Linux as a product of the development of an open source environment (open code) in the world of software programming and development, has been proven as a stable Operating System [4]. Linux can be used as an alternative information technology solution, this is because Linux is "free" and has high quality so it does not need to continue to depend on ready-made commercial software products made by certain companies or vendors [4]. Users of the GNU / Linux Operating System are given the opportunity to build and develop an Operating System that suits their individual needs [5]. Information Technology Education is a department at the University of PGRI Semarang with subjects studied including multimedia, programming and computer networks throughout which there are general courses and educational courses. However, there are still many Information Technology majors who are still using pirated Operating Systems and software, perhaps because students are already familiar with and familiar with the Operating System so they do not want to move to an open source Operating System and maybe because teachers and students also experience difficulties in installing supporting programs because they must be connected to the internet network and limited information regarding open source applications on Linux.

### B. Problem Formulation

Based on the background described above, the author formulates the existing problem namely:

1. How to develop an Open Source Distribution Operating System The Zero based on Ubuntu Linux to minimize valid Software piracy?
2. How to develop an Open Source Distribution Operating System The Linux-based Ubuntu to minimize software piracy that is practically used by students
3. How to develop Open Source Distribution Operating Systems The Zero based Linux Ubuntu

to minimize software piracy that is effectively used by students?

**C. Scope of Problem**

In order for the research to be conducted to be clearer, more directed, and more focused on the problems faced, the need for limitation of the problem in research ii is as follows:

1. Making an Operating System derived from Ubuntu with the Remastering method that suits your needs.
2. This operating system is guided by students of Information Technology Education Study Program.
3. Software contained in the Operating System in the form of software needed by Information Technology Education students in lecture activities.

**D. Research Purposes**

Based on the background and formulation of existing problems, the objectives of this study are:

1. Creating an Operating System derivative of Ubuntu based on open source that can be used legally and freely which is then made Ubuntu remastering that has been packaged in one package.
2. Minimizing software piracy, especially the Operating System among students.

**II. LITERATURE REVIEW**

**A. Operating System**

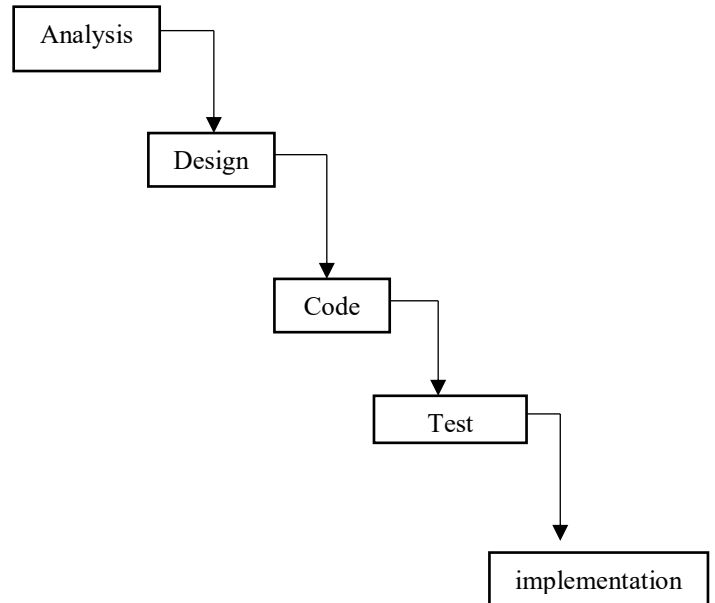
In general the operating system is software in the first layer that is placed on the computer memory when the computer is turned on. While other software is run after the operating system is running, and the operating system will perform general core services for the software[6].

**B. Open source**

Open source software is an integrated device development that is made open so that it can be learned and re-developed by other developers. Open source software is defined as software that is developed in mutual cooperation without official coordination, using program code (source code) that is freely available, and distributed through internet media [7]

**C. Linux**

Linux is an GNU / Linux based operating system that is open source so that it can be downloaded for free [8]. ow the Linux operating system is used as one of the safest and anti-threat system operations which is one of the best protection mechanisms to provide an operating system [9].



**D. Ubuntu**

Ubuntu is one of the Debian based Linux distributions. The name Ubuntu is taken from the name of an ideal concept in South Africa, "Ubuntu" comes from the ancient language of Africa, which means "a sense of humanity towards fellow humans". Ubuntu is a Linux-based Operating System, freely available and has good support, both from the community and professional experts [10].

**III. METHOD**

Research and development method (research and development) is a research method used to develop or validate products used in the field of education and learning. Research and Development methods are research methods used to produce certain products, and test the effectiveness of these products

The procedure for conducting research and development is done with the waterfall model. The Waterfall Model is the simplest model for software development with specifications that vary with the stages of development including 1) analysis, 2) design, 3) program code, 4) program testing 5) implementation and maintenance. Here are the stages of the waterfall model.

**A. Analysis of software requirements**

This method aims to gather any needs needed in system design, including software, hardware, and data needed

**B. Design**

Soft anchor design is a rare multi-process that focuses on the design of making software programs including data structures, software architectures, interface representations and coding procedures.

**C. Program Code**

At the stage of writing the program code, the interface design that has been designed will be translated into languages that can be recognized by the computer in order to work in accordance with the functions that have been designed

**D. Testing**

After the program code stage is complete, the application system will be tested and will be validated by the application. The purpose of this test is to ensure that the program built is in accordance with the design and all functions can be used properly. After this stage the software will be handed over to the user.

**E. Implementation or maintenance**

It is possible for a software to change when it has been sent to the user. Changes can occur if errors occur and are not detected when testing or software must adapt to the new environment. The support or maintenance stage can reduce the development process starting from specification analysis to changes in existing software, but not to create new devices.

**IV. RESULTS AND DISCUSSION**

**A. Stage Of Analysis**

The process of needs analysis is the process of finding the operating system needs. The process of needs analysis carried out consists of analyzing software and hardware requirements that are used as well as analyzing the results of observations and interviews with lecturers. Through unstructured observation and interviews with lecturers, information was obtained that lecturers and students still used illegal Operating Systems. The operating system used by lecturers and students is the Windows Operating System. In addition, not many students are familiar with the Open Source Linux Operating System.

**B. Stage of Design**

The design stage consists of designing student support interfaces and applications. In addition, at this stage the researcher also designed the research instrument in the form of a validation sheet, at this stage the researcher also produced the design of the Boot Menu Operating System, Login Menu, Desktop Menu, Application Icon, Tray Bar Menu and supporting applications. The Open Source Operating System is designed as attractive as possible so that students are easy to operate and at the same time students can turn to a legal Operating System

**C. Stage Of Coding**

At this stage the software is translated into a software program. In the coding phase the program consists of processing graphic objects and arranging application content needed by students. At this stage the author prepares files and data to be loaded into an easy-to-use Operating System. Then the author composes content in the form of images, icons, text. Being the open source operating system Distro Zero uses Pingu Builder Software, so it can back up all the files and data on the modified Operating System, so that the operating system can be packaged into an extension \*.iso thoroughly.

**D. Stage Of Testing**

The test aims to find on the system and find out the suitability of the system made with user needs. Tests carried out on functional aspects, functional testing serves to test the feasibility of the operating system based on functional requirements. Tests are performed on expert validators and user responses.

**E. Stage Of Impementation And Maintenance**

The implementation stage is the stage of making the Operating System as the result of the design phase. Implementation of The Zero Distribution Operating System uses the Remastering method. Remastering makes it easy to implement stages because with remastering it allows the author to add or reduce application packages on the existing operating system with the new application package. design to be a Zero Distribution Operating System. Based on the object of research that the author took in the development of The Zero Linux Distro based on Ubuntu, the main target of this Development was all Information Technology Education Study Program students. The use of software in this study is that students are expected that with this research all students of Information Technology Education Study Program will switch to using open source software.

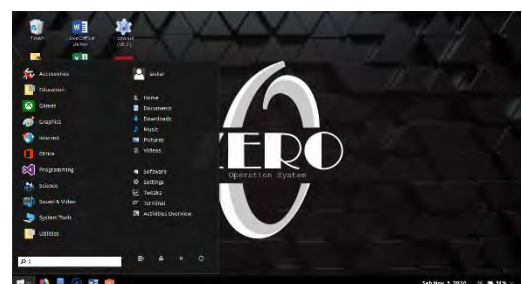
In this discussion there are 4 discussions, namely discussion of the results of the application, discussion of the results of validation, discussion of practicalisation, and discussion of effectiveness:

- 1) is the Open Source The Zero Operating System based on Ubuntu Linux to minimize software piracy among students. The following picture is the product design that has been made



Picture 1. desktop Display The Zero OS

- 2) The product that will be produced in this study is the Open Source The Zero Operating System based on Ubuntu Linux to minimize software piracy among students. The following picture is the product design that has been made

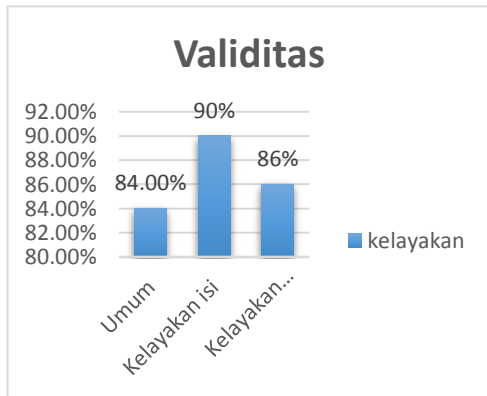


Picture 2. Display Star Menu The Zero OS

3) Discussion Of Validation Results

The validity that aims to determine the feasibility of the Open Source Operating System is carried out by two expert validators on the media through validity assessment instruments. Based on these criteria the overall results of validity are 86.67%, the Open Source Operating System is included in very valid criteria. In addition, based on the results of the validity test, it was concluded that the Open Source Operating System based on Ubuntu Linux was declared valid and feasible to use.

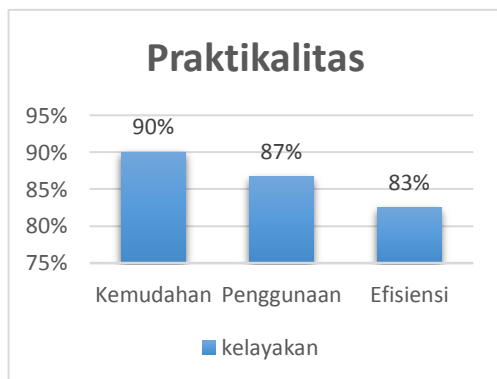
Table 1. Validity Chart Diagram



4) Discussion Of Practical Results

Practical test which aims to determine the extent of the ease and implementation of the Open Source Operating System made and acknowledged by 2 experts on the media through a practical assessment instrument sheet. Operating Systems have three objectives that must be met, namely comfort, efficiency, operating systems must make computer use more comfortable and able to evolve. Based on these criteria the overall results of validity are 91%, the Open Source Operating System is included in the very practical criteria. In addition, based on the results of the Practicality test, it was concluded that the Open Source Operating System based on Ubuntu Linux was declared practical and feasible to use

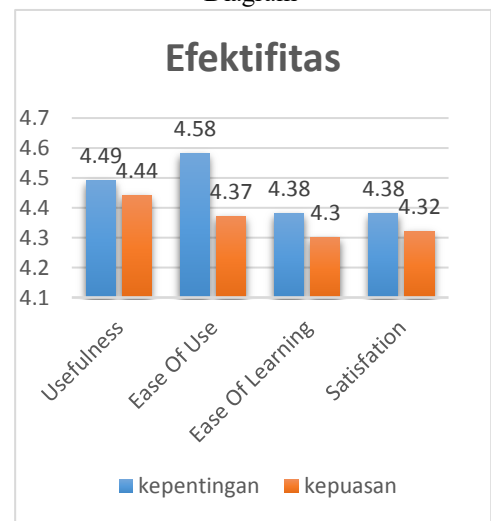
Table 3. Practical Feasibility Chart Graph



5) Discussion Of The Results Of effectiveness

This effectiveness test aims to assess satisfaction or positive impact which is the result of the Open Source Operating System and is carried out by 6 respondents satisfaction assessment of the media through a sheet of user satisfaction assessment instruments consisting of assessment of interests and satisfaction. Based on these criteria the overall results of validity are 87.24%, the Open Source Operating System is included in very effective criteria. In addition, based on the results of the Effectiveness test, it was concluded that the Ubuntu Linux-based Open Source Operating System was declared effective and feasible to use

Table 2. Effectiveness Feasibility Chart Diagram



V. CONCLUSION

The conclusions obtained from the results of research, the development of the Open Source Distribution Operating System based on Ubuntu Linux, have met the criteria of validity, practicality and effectiveness so that it is feasible to be used as an alternative media for a legal operating system. Based on the formulation of the problem carried out through research on the Open Source Distribuion Operating System, The Linux-based Ubuntu obtained the following results:

A. Calculation Of Validity Test Results

Based on the calculation of the validity test results are as follows, the results of the evaluation of general aspects are 84%, the aspect of content eligibility is 90%, and the aspect of media feasibility is 86%. The results of the above calculations can be concluded that the Open Source Operating System is classified as very valid and declared very feasible to use.

B. Calculation Of Practicality Test Result

Based on the calculation of the practicality test results are as follows, the results of the assessment of convenience aspects are 90%, the usage aspect is 86.67%, the efficiency aspect is 82.5%. The results of the calculation aspects of practical testing by experts are 91%. From the results of the calculations above it

can be concluded that the Open Source Operating System is classified as very practical to use.

#### C. Calculation Of The Results Of The Effectiveness Test

Based on the calculation of the effectiveness test results using the CSI model (customer satisfaction index) or called IKP (User Satisfaction Index) is as follows, the column of interests in the usability aspect scores an average of 4.49, the facilitation aspect gets an average score of 4.58, aspects of ease of learning get an average score of 4.38, and satisfaction aspects get an average score of 4.38. Then the total score for the interest column (Y) is 17.83, then the satisfaction column in the Usability aspect gets an average score of 4.44, the ease aspect gets an average score of 4.37, the ease of learning aspect gets an average score of 4, 3, and satisfaction aspects get an average score of 4.32 and then get a total score (S) of 77.78, the results of the calculation of the effectiveness test by respondents is 87.24%. From the calculation of daiatas it can be concluded that the level of satisfaction of the open source operating system is classified as very satisfied and is declared very effective to use.

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