



Digital Information Board Using Raspberry Pi 3 Model B Based on Raspbian

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ABSTRACT

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Digital Information Board (Digital Signage) is a digital content management application that has been programmed to be able to display a sequence of information or messages to the target audience / audience effectively, quickly, precisely and reliably. Digital signage pampers the audience's eyes in providing an attractive and attractive visual spectacle, various messages or multimedia format information can be played smoothly, including images, videos, scroll text / running text, charts, graphs, schedules, news, weather presented dynamically using electronic display media such as LCD TVs, Plasma TVs, Projectors, and Digital Billboards as output. This research was carried out by utilizing the Raspberry Pi 3 Model B microcontroller as a webserver for digital information board media (digital signage) then with a WEB display as the output of the displayed display. Testing is carried out on the WEB, so that the web is made as expected and also valid. With the Digital Information Board using Raspberry, the information or message conveyed to the audience / audience will be more effective and efficient.

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1. Introduction

Digital Information Board (Digital Signage) is a digital content management application that has been programmed to be able to display a sequence of information or messages to the target audience / audience effectively, quickly, precisely and reliably. Digital signage pampers the audience's eyes in providing an attractive and attractive visual spectacle, various messages or multimedia format information can be played smoothly, including images, videos, scroll text, charts, graphs, schedules, news, weather that are presented dynamically using media electronic displays such as LCD TVs, Plasma TVs, Projectors, and Digital Billboards as output. [1]

These computer-based digital bulletin boards nowadays usually use a network-connected computer that can be controlled remotely to control what is displayed. Initially, a form of digital signage that is often applied is to use a set of desktop computers connected to one or more plasma TVs to display information. Along with the rapid development of technology, the use of desktop computers has begun to be replaced by a single board computer (one of which is the Raspberry Pi or often called the Raspi) which is considered more practical and more energy efficient in its use. [1]

The problem that occurs in the Net Centric Computing Laboratory at the Faculty of Engineering, University of Ibn Khaldun Bogor is the ineffective way of delivering information. The way of conveying information is still using a sheet of announcement paper or from one person to convey information to another, so that the information received is sometimes still unclear. For this reason, digital information delivery media is needed in the Net Centric Computing Laboratory. By doing so, it is hoped that the information conveyed can be clearer and the way of delivery is more attractive and dynamic. Based on the background, the problems in this thesis can be formulated into: (1) How to make a digital information board using the Raspberry Pi 3 Model B with the Web ?. (2) How to test the Web-based digital information board Raspberry Pi 3 Model B with a Black Box?.

2. Research Method

This research method is a framework for carrying out an action or a frame of mind to formulate an idea that is directed and related to the aims and objectives. The method used in this study is shown in Fig 1.



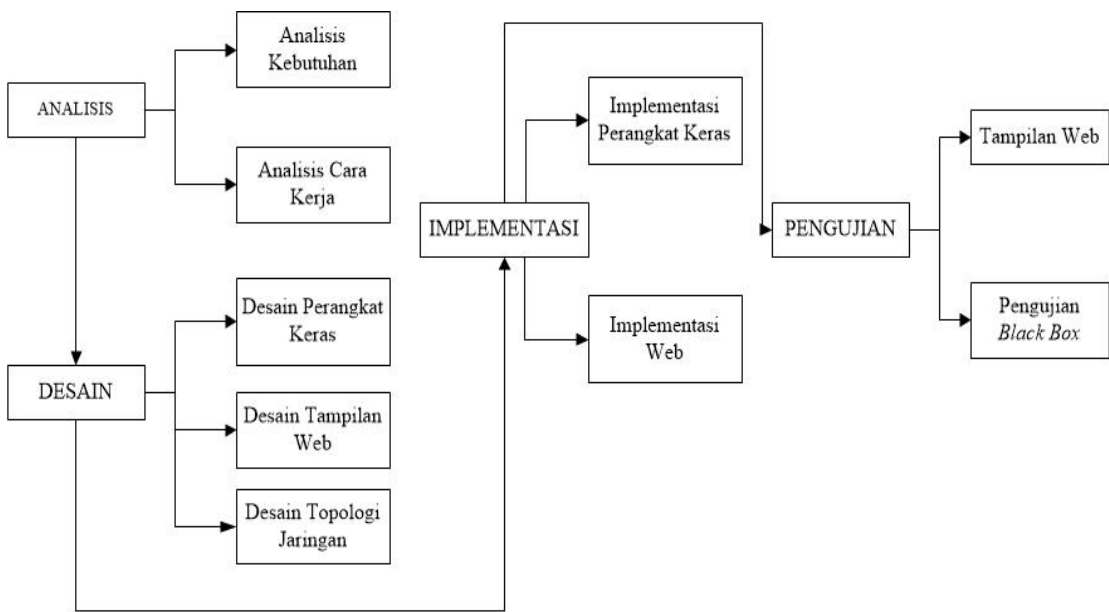


Fig 1. Reserch Method

3. Result

3.1 Analysis

Fig 2. explains how the system works in this study starting with, raspberry pi 3 model b that has been conFig and there is already a web as a display of the digital information board and raspberry pi has been given an ip address. Then, the web can be accessed via the local network in the Net Centric Computing Lab by writing the ip address in the browser used. The web which becomes a digital information board display is then displayed on the LCD screen.

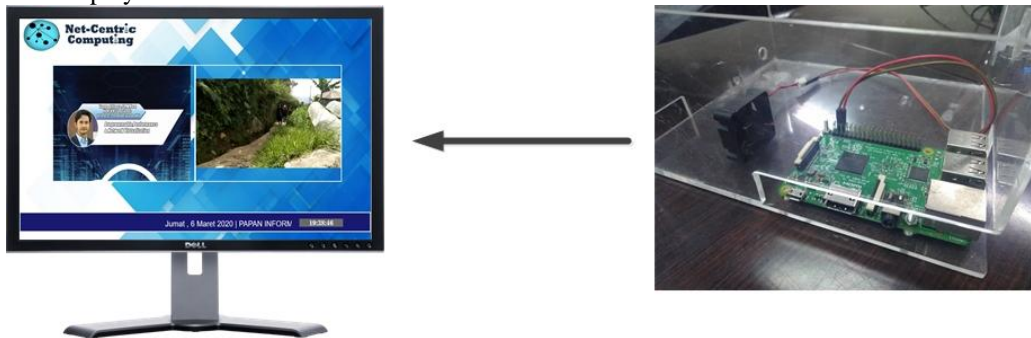


Fig 2. How the System Works

3.2 Design

a. Hardware Design

The hardware design stage is carried out by restoring components that are in accordance with the function of the system requirements. The whole system consists of several parts which are illustrated by the block diagram in Fig 3.

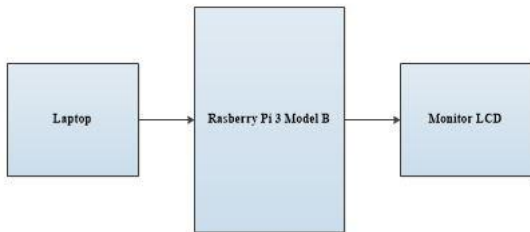


Fig 3 Hardware Design

Based on the block diagram in Fig 3, the whole system is divided into three parts. Laptops are used as a device for filling in the software needed on the controller, the controller as input or sending instructions as well as for designing displays or displays and an LCD monitor as output. The following is a breakdown of the types of each relationship.

b. Network Topology Design

The network topology design in the image below shows that the Raspberry Pi is connected to a switch, of course a series of digital information board tools have been programmed according to the programming instructions that have been made.

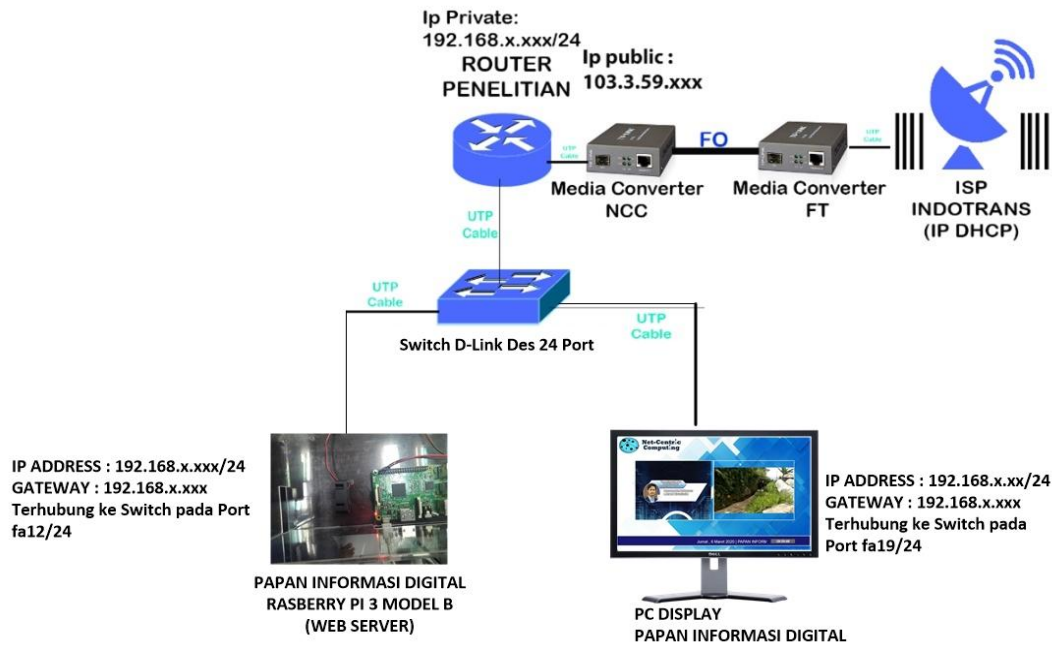


Fig 4. Network Topology Design

In Fig 4 is a drawing of the network schematic design that will be made on a series of tools. To connect the Raspberry Pi 3 Model B to the CISCO switch, given the IP address 192.168.3.208/24 using a UTP cable. The CISCO switch is connected to the MikroTik Router with the IP Address 192.168.3.100/24. The MikroTik router is connected to the Indotrans ISP. For PC Display, the Digital Information Board is connected to the Switch with IP Address 192.168.3.20/24, to open the Digital Information Board Web from the PC Display, access the Raspberry Pi IP Address on the Web Browser.

3.3 Implementation

In Fig 5 is the installation stage of the Raspberry Pi 3 operating system. The operating system used is Raspbian. Installation was carried out with BalenaEtcher software. The Raspbian operating system installation target is Micro SD, which will be used after the installation process is complete, the Micro SD will be used on the Rasberry Pi 3 Model B.

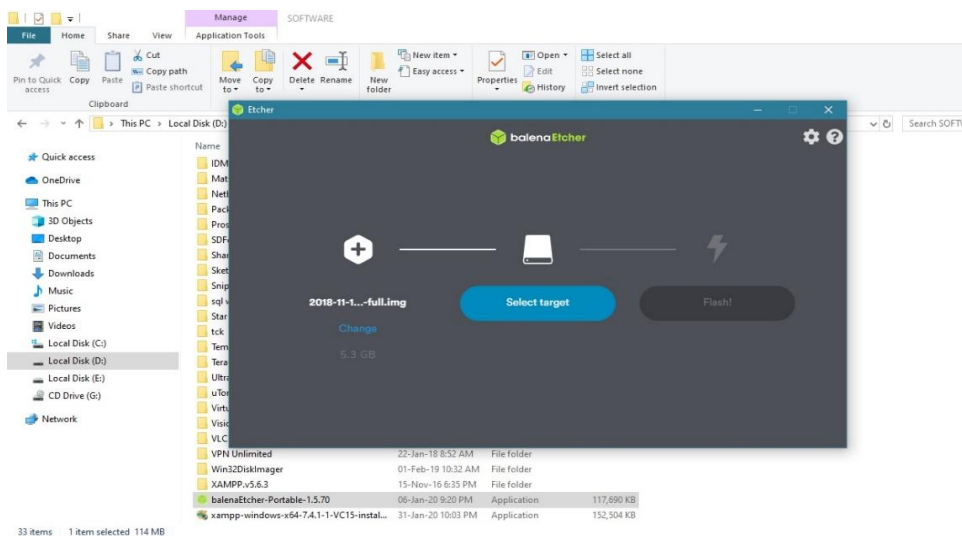


Fig 5. Implementation

3.4 Testing

The second black box test is carried out on the admin page, with the aim that the admin page is made as expected and valid. The following is the test table from the admin page.

Table 1.
testing admi page

No	Test Name.	Test Case	Expected results.	Test result.	Conclusion.
1	Upload Image	Select Image, then update	Image has been changed successfully, then entered in database and admin page.	According to expectations	Valid
2	Delete Image	Select delete on the image table	Image deleted successfully	According to expectations	Valid
3	Upload Video	Select a video, then update	The video was successfully changed and entered into the database	According to expectations	Valid
4	Delete Video	Select delete, in the video table	Video deleted successfully	According to expectations	Valid
5	Update Running Test	Update the running text in the column.	Running text has been successfully changed	According to expectations	Valid

Table 1 shows some of the tests carried out on the admin page, and the admin page is obtained that matches expectations and is also valid. Here are some pictures from the test results.

4. Conclusion

Based on the discussion and results of this study, the following conclusions were obtained: (1) From the research conducted, the conclusion is, can use the Rasberry Pi 3 Model B as a Raspbian-based Digital Information Board Webserver. (2) The results obtained from testing Black Box, namely a Web that has been made as expected and also a Valid Digital Information Board Web.

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