

Raspberry Pi Based Online Examination System

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ABSTRACT: Online Examination is a great opportunity for exponential Growth. Online Exam system fulfils the requirements of the institutes to conduct the exams online. Today all online examination system is based on the browser/server structure or client/server structure and for these system required the computer to every student. As the number of student increases cost of examination also increases. In small schools and institutes could not able to afford a computer to every student. Instead of these to design an embedded device with only one master computer and number of slave units. The system includes Raspberry Pi with 7 inches Touch screen LCD and Wi-Fi dongle. It reduces the cost and size. Master unit control all slave units, information/Question can be send from master unit to slave unit and answer can be send back to master unit. Master unit will start analysing the answers with the standard format stored in it. After completion the Master unit will send the result to slave unit and result can be display within some time.

KEYWORDS:Raspberry Pi, 7 inches LCD screen, Wi-Fi Dongle, Computer, HDMI connector, PHP Programming.

I. INTRODUCTION

Now a day all the examination conducted is manual or online examination. The need of exams today in universities, schools, colleges and even companies for recruitment purposes. The general paper-pen tests/exams are now slowly being replaced by the online internet based testing system. Online ExamsSystem is a web application that establishes a network between the institutes and the students. This Web Application provides facility to conduct online examination worldwide. It saves time as it allows number of students to give the exam at a time and displays the results as the test gets over, so no need to wait for the result. It is automatically generated by the server. Administrator has a privilege to create, modify and delete the test papers and its particular questions.

Online Examination system based on Browser/server mode or Client/server mode and it required Internet/Intranet. All the online examination system required computer for every student. But small schools, institutes and company could not able to afford computers, so that design an embedded device using Raspberry Pi with 7 inches LCD screen and Wi-Fi which is small in size and low cost. In this only one master computer control all slave units. In this Questions can have multiple options, multiple answers or can be text answers Including Images, Mathematical Equations and Diagrams.

II. PROPOSED SYSTEM

Main objective to implement this project is to design and develop a low cost reliable and efficient technique for online examination system. Proposed system consist of a Raspberry pi used as minicomputer, 7 inches touch screen LCD for display purpose, Wi-Fi dongle for communication purpose between master computer and slave units. Master unit control all slave unit and also save all data and student information such as student details, login and password and results. All the question paper store in the master unit and after connection establish and After start command given from Master computer the Slave unit will Start the Exam. After exam completed the answer go back to the master unit , its check with standard answer store in it and display on slave unit at the same time it store in master unit also.

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III. RELATED WORK

The previous all examination system is depend on browser server structure or client server structure. And examination system needs an Internet connection. Most of the online examination system uses a java script language and JSP (Java Server Program with a database). Also the online examination system used the different authentication for identification of every student. The identification can be done with different authentication. But all this required computer system. So that design a system with only one master computer and other is a slave units. System consists of two units one is a master unit and second is slave unit. The master unit consist of master computer which is control the all slave units. The slave units consist of Raspberry Pi 2 module B, 7 inches touch screen LCD, Wi-Fi dongle, HDMI cable each block explain below. Following block diagram shows two units and hardware used in system.

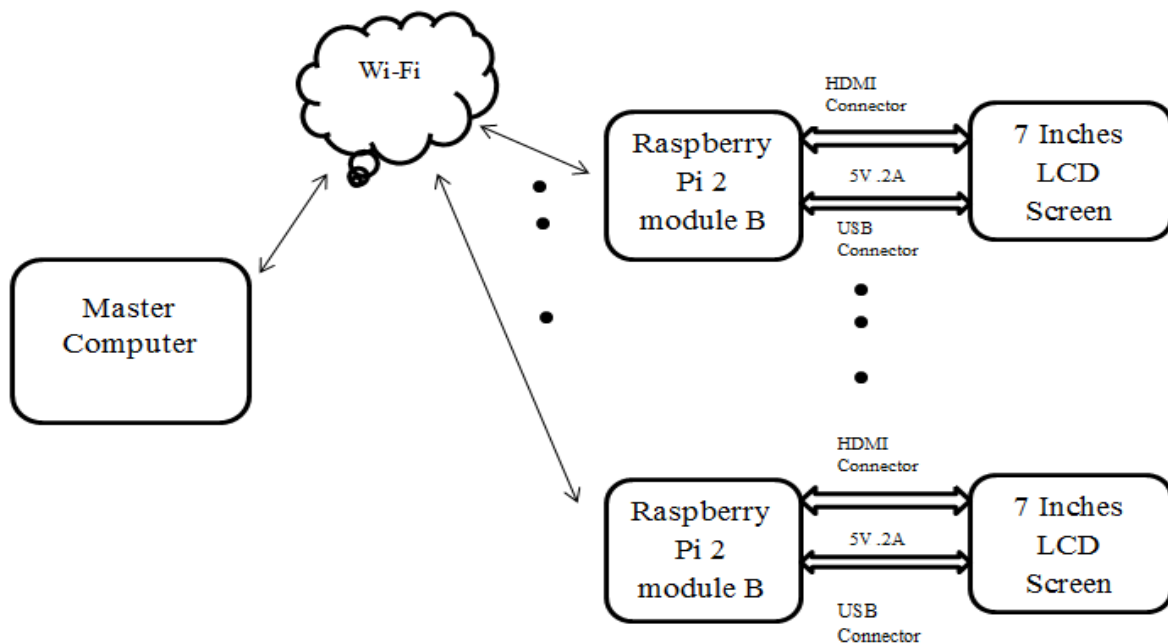


Fig .1Block diagram of a system

Master unit consists of a Master computer which is connected to Intranet for sending and receiving of the questions and answers. It is used for sending the data (Question Paper) to Slave Unit and also receiving the final data from the Slave Units. The Slave unit consist of raspberry pi, & inches LCD screen, Wi-Fi Dongle, HDMI cable. Raspberry pi is a low cost small and portable size of computer board it has a high performance powerful processor its main core language is raspbian OS can also develop script or program using python language. Raspberry pi 2 has CPU 900 MHz BCM2836 quad-core ARM Cortex-A7 Memory,1GB RAM, It has a 40 pin GPIO connector,micro SD. Purpose of using raspberry pi 2 module B is it provide 1 GB RAM and it is compatible with Wi-Fi connection and 7 inches touch screen LCD. All the data of master unit is connected with a raspberry pi and then display on LCD.The ARM-based BCM2835 is the secret of how the Raspberry Pi is able to operate on just the 5V 1A power supply providedby the onboard micro-USB port. It's also the reason why you won't find any heat-sinks on the device: the chip's low powerdraw directly translates into very little waste heat, even during complicated processing tasks. The raspberry pi 2 module B running idle 200mA current. With Wi-Fi running, that adds another 170mA. If you have Ethernet instead, that adds about 40mA.

The 7" Capacitive Touch Screen LCD enhances the UI experience in any project. It supports various systems such as Raspberry Pi, Banana Pi, Banana Pro, BeagleBone Black etc. The built in HDMI(High Definition Multimedia Interface) interface enables the display to work as computer monitor just like any other HDMI screen. It has 800×480 high resolution; Supports Raspberry Pi comes with Raspbian driver. LCD screen provide backlight switch used to turn

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on and off backlight. Current drawn in LCD is 600mA total. You can reduce that down 400mA by running the backlight at half brightness. Backlight off the decoder and display itself draws 250mA current. Connect the LCD to the HDMI on the Raspberry Pi board with a HDMI cable for displaying control. Connect the USB Touch interface on the LCD to the USB interface on the Raspberry Pi board with a USB type-A male to micro-B cable. The HDMI uses TMDS (Transition Minimized Differential Signaling) to move information from one place to another. Wi-Fi Dongle is connected to raspberry pi. Wi-Fi is used to establish wireless connection between master unit and slave unit. The range of Wi-Fi is 50 to 100 meter. Operating Frequency of Wi-Fi is 2.4GHz. Though the Wi-Fi data can be send from master unit to slave unit and back to master unit also.

Software:

The programming language used in this project is PHP(Personal Home Page).PHP, a scripting language designed specifically for use on the Web, is your tool for creating dynamic Web pages. Rich in features that make Web design and programming easier, PHP is in use on more than 20 million domains. PHP is particularly strong in its ability to interact with databases. PHP is very easy to understand and faster than other language. PHP is highly compatible with MySQL database. PHP and MySQL are frequently used together. MySQL (Structural Query Language) is a popular database with web developers. Its speed and small size make it ideal for a web site. PHP can accept and validate the information that users types into a web form and can also move the information into a database. Database is an electric file cabinet that stores information in an organized manner. MySQL handles databases up to 50 million rows or more and default file size limit for a table is 4GB.

IV. IMPLEMENTATION RESULTS

After the power supply given to the slave unit the raspberry pi and LCD screen initialized. After start command given from Master computer the Slave unit will start the Exam. The Question paper sends to the master unit. Which question paper come from master unit to slave unit is depend on administrator. The administrator assign the question paper set that question paper shown on slave unit after the login and password of user are correct. After login the exam start and the timer is also start. After time up or After Final submission the slave unit send the result to master unit. Master unit will start analysing the answers with the standard format stored in it. After completion the Master unit will display the result within some time on slave unit and also store the result in master unit.

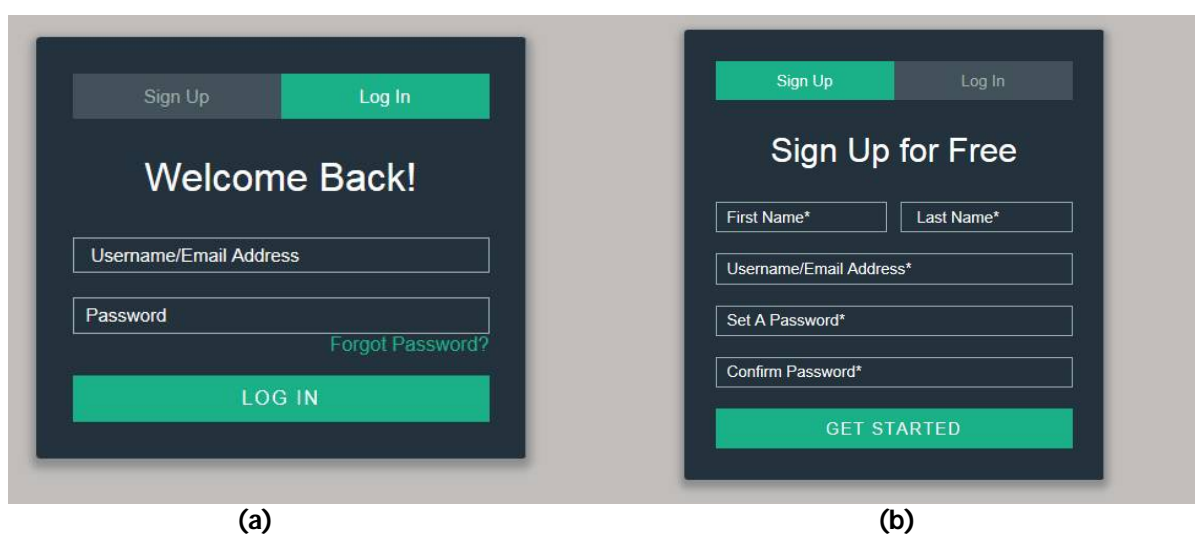


Fig. 2 (a): Log In screen (b) Sign Up screen

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Figure 2(a) show the Log In screens if user already registered. If new user want to register for exam, it select registration window that is Sign up in figure 2(b). After the login and password is correct the next screen display on LCD which is shown below.

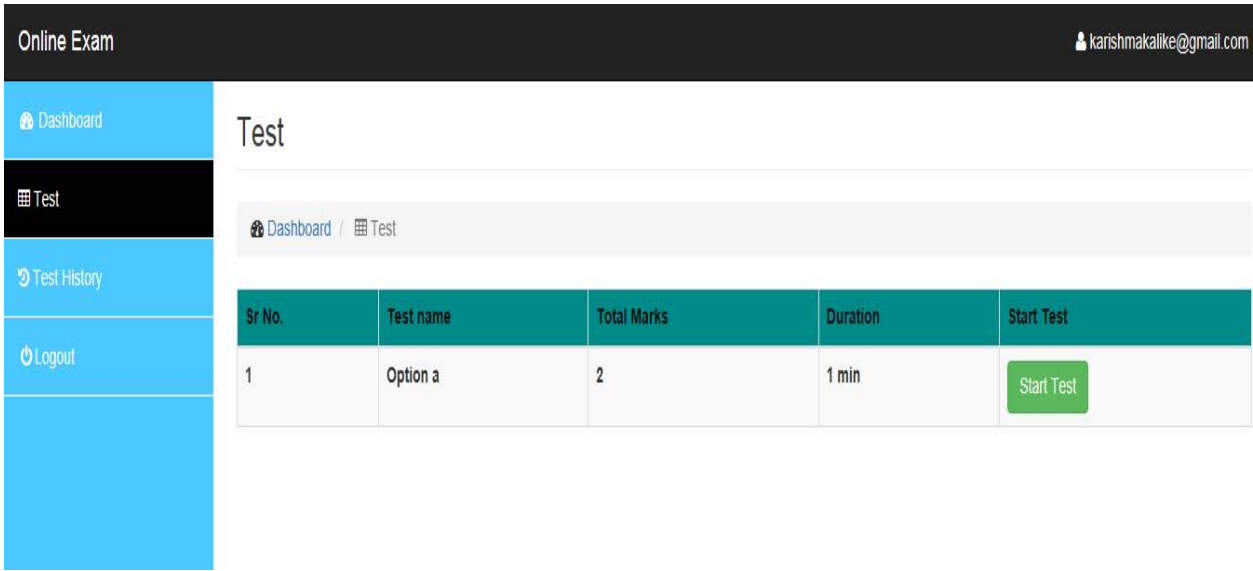


Fig 3:Test Window

After the sign in the next window is dashboard and in that there is a Test, Test History and Logout option is available. Figure 3 is Test Window. Test window shows the Test name, Total test mark, Duration of test, and start option. Click on this button and exam start.

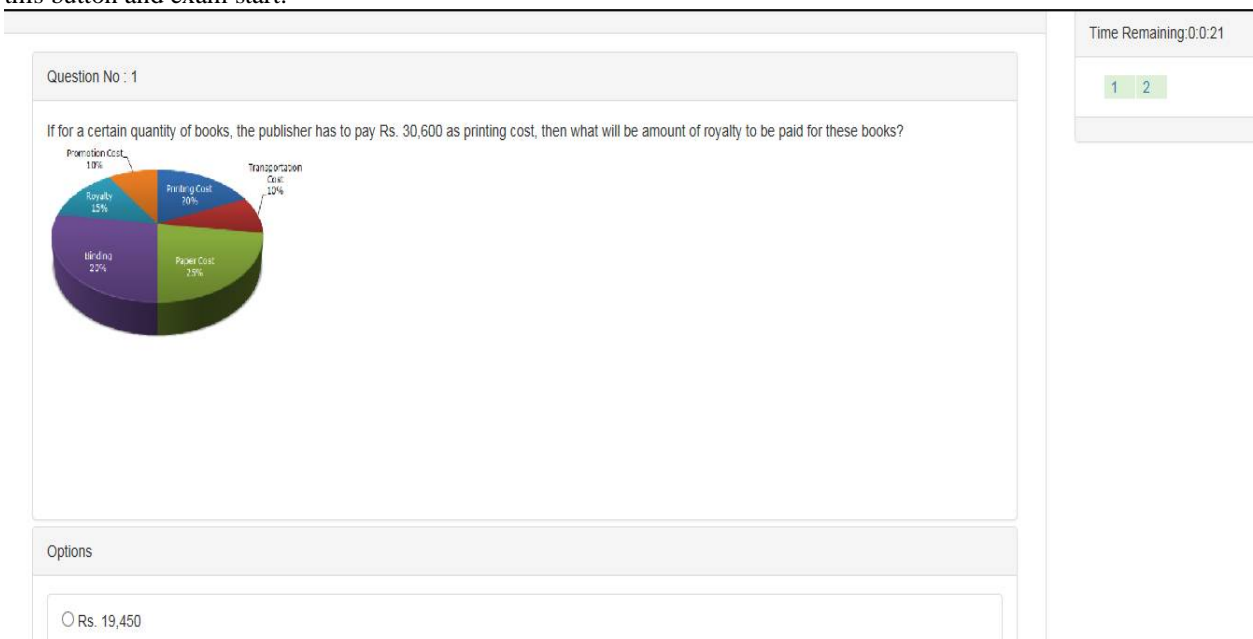


Fig 4: Display Question Paper

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Question paper window shown above in Figure 4. In this actual question display on screen and after submit the current question or if click on next button next question can be display. Right hand side of the screen the number of question in this paper is display.

Online Exam

Your Test Submitted Successfully

Test Name	Total Question	Total Time	Total Marks	Required Marks	Total Marks (Obtained)
Option a	2	1 min	2	1	1

[Back to Home](#)

Fig 5: Result Window

Result window show like Figure 5 after the exam completed. This window shows that a test name, total question, total time for exam, total mark , required mark for passing and last is obtained mark for particular candidate.

V. CONCLUSION

Online Examination System provide more effective and efficient examination environment with low cost and small size device. Each Slave unit communicate with master computer and after the exam finished the result can be display on slave unit and store in master computer. Using this we able to reduce the requirement of computers and hence the cost is reduce. This is very useful in school, Institute, and companies for examination purpose.

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