

Raspberry Pi based Offline Data Streaming using Android

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Abstract - In this project, Raspberry Pi-based Offline Data Streaming using Android, we used Wi-Fi router to synchronize data between Raspberry Pi and Mobile Application (Android). Raspberry Pi has in built Wi-Fi and Ethernet port for the connectivity. We use memory card as HDD in Raspberry-Pi to store various kind of data. For this system, we use a memory card of size 64 GB to store data in the system. The main purpose of this system is to serve multiple users with training videos, educational books and college notices without using the internet. We only use Wi-Fi to connect mobile devices to the Raspberry Pi. There is no need of Internet connection but only Wi-Fi connection is sufficient to access the data. We can even download the content like training videos and educational books in the mobile application in order to watch them offline when we are not present inside the college premises. The maximum number of users that can connect to the system at a time is 25. But the total number of users directly depends on the router capacity and Raspberry Pi. In order to manage data (Training videos, Educational book, and notices) we provide a control panel to the system administrator, so that admin can manage content at any time. We use Raspbian OS for Raspberry Pi. We use the XAMPP server in the Raspberry Pi.

Keywords: Raspberry Pi, Wi-Fi, XAMPP, Offline streaming, Android.

1. INTRODUCTION

In the 21st generation, each and everyone are using android mobile phones that have Wi-Fi function which provides smart browsing capability. By taking advantage of this function, we are going to use offline data streamer that can be used by every user and can enjoy different media that will be stored in the Raspberry Pi by the admin. Since, we are going to use Raspberry Pi that has the inbuilt Wi-Fi hotspot function to broadcast the media. In the Raspberry Pi there is one static IP, in that there are some PHP files which will access to the user end and they will be able to access the data whatever available on the PHP page. All this work will be done on Raspbian OS platform that contains XAMPP Server. By connecting to the WI-FI provided by Raspberry Pi, your phone, tablet or laptop is able to access the data through an offline-server provided by the Raspberry Pi. Videos, books and notices can be loaded, downloaded and read from the user android application. This system provides the admin as well as user to access the system. Through this system, admin adds any

kind of data such as training videos, educational books and important notices. Admin is responsible to add, edit or delete these kinds of data which is stored in the MySQL database in the XAMPP server. All these data is been managed in the Raspbian/ Ubuntu Operating system by the admin. In order to change the data management or storage, the admin has to first login in to the web page of this system. By using this application, any user or any student have to first register incase if the user has to login. Users can also download the video or books for further use in case they are not present in the premises that have the Wi-Fi connection of the system. Users can also read or load videos, books and notices by just connecting to the system. The whole system works mechanically by merely powering the Raspberry Pi.

2. LITERATURE REVIEW

A review of the literature provided in this section includes a brief overview of Raspberry Pi, a review of previously published articles and contributions of our research. Raspberry Pi is a low cost, credit card size microcontroller. The memory card which we are using is HDD which as 64 GB of capacity to store the data. Raspberry Pi has already in built Wi-Fi and Ethernet connection which is required to develop this system. Apart from this, it has 4 USB ports, HDMI, 1 GB Ram, Audio Jack etc.

Paper 1: Lynn [1]

In this paper Lynn discussed about two researchers, Bock and Jalia from Cambridge University, who conducted “a pilot project exploring possibilities of providing computing access and education in rural schools in India (p. 1)” by using Raspberry Pi. The main idea of using Raspberry Pi was getting students engaged in computing and learning to program. However, Raspberry Pi was used as a standalone computer to compose music, drawings and build robots.

Paper 2: Slaven [2]

Slaven explained about the “development of an offline server, named ‘RACHEL’, which was not connected to the internet. Raspberry Pi was used as a means of improving education provision in rural areas. 25 Raspberry Pi’s were installed in schools to be used in Cameroon to the power generator to give possibilities to their students and teachers to learn spreadsheet and word processing. Slaven

also discussed that two researchers, Bock and Jalia, from Cambridge University who introduced Raspberry Pi in Ecuador as “part of their long-term plan to ensure the sustainability of using Raspberry Pi based education content”.

3. SYSTEM ANALYSIS

A. Problem Definition

With the advance technology and rapid increase of Internet of Things devices in our daily life, we are seeing a growing market of streaming analytic. The types of analysis of streaming data vary depending on an application, but they can be grouped into two major categories: online and offline. The main objective of this system is to go beyond and introduce scalable as well as maintainable architecture for performing online and offline data streaming. The Raspberry Pi-based Offline Data Streaming using Android system is specially designed to assist and provide support in order to fulfill the needs of college going students.

B. Scope

This application can be used in school and colleges. User can use this application at any place. This application saves the time of user. If the user wants to see offline videos and books, then user can download the content.

C. Proposed System

Raspberry Pi based Offline Data Streaming using Android is the proposed system. The main component of this proposed system is Raspberry Pi. We have used Raspberry Pi for the admin panel wherein admin manages all the data that needs to be stored in the MySQL database of Raspberry Pi. In Raspberry Pi we are using HDD memory card which has 64 GB of capacity to store all the data. Admin manages all the training videos, educational books and important notices in the MySQL database. Admin can also add, edit as well as delete any kind of data from the database. In this system, we are using Wi-Fi router in order to synchronize the data from Raspberry Pi to the mobile android application. Since, Raspberry Pi has in-built Wi-Fi and Ethernet connection, the data is transferred through this connectivity to various android application users. Application users will first have to get connected to the Raspberry Pi Wi-Fi so that to get all the videos, books and notices displayed in their application. After getting the access to the Wi-Fi, if user is not logged in into the application, user will have to register first. This data is being sent from Raspberry Pi to their application.

Users can also download the video or books for further use in case they are not present in the premises that have the Wi-Fi connection of the system. Users can also read or load videos, books and notices by just connecting to the system. Maximum number of students that can get connected to the system is 25 at a time.

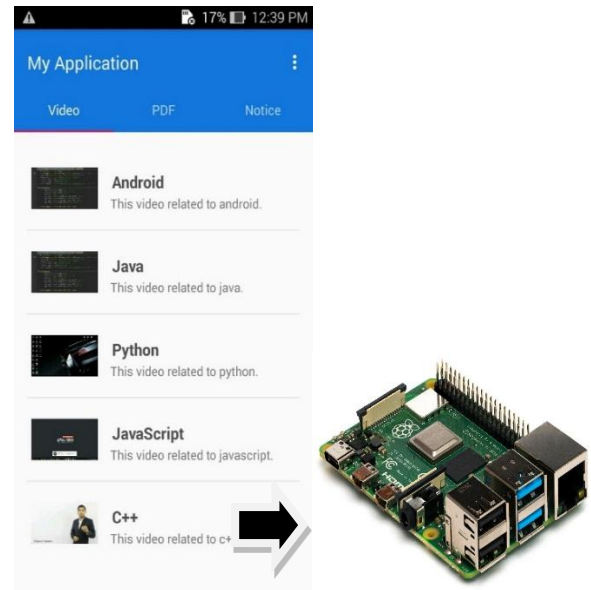


Fig -1: Block Diagram

D. Working

I. System Working:

The popular operating system that is used in the Raspberry Pi is Raspbian OS or Ubuntu OS. We are using XAMPP server in the Raspberry Pi. In the XAMPP, Raspbian is a Debian-based computer operating system which is used in Raspberry Pi. It is software that contains the set of basic programs and utilities that create our Raspberry Pi run. However, Raspbian provides over a pure OS that comes with over multiple packages, pre-compiled code bundled in an exceedingly nice format for straightforward installation on our Raspberry Pi. User first needs to connect to the Wi-Fi. Next they need to open the application and make registration first. After successful registration, now user needs to login through the registration details if the detailed entered by user matches. User will get able to access the videos, books, notices. To view or download.

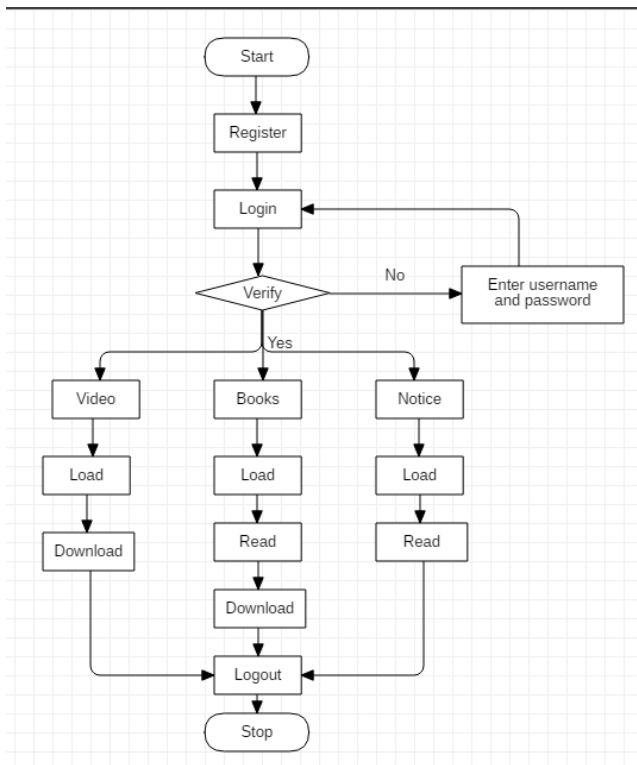
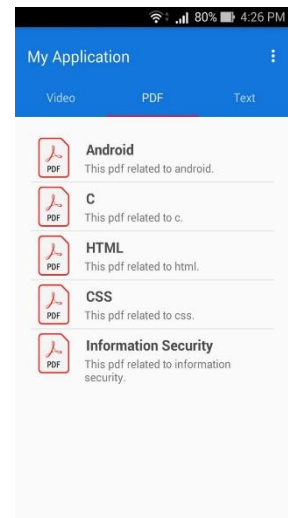
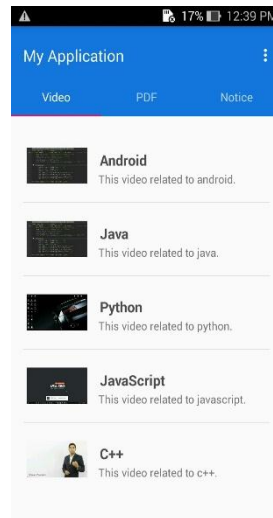
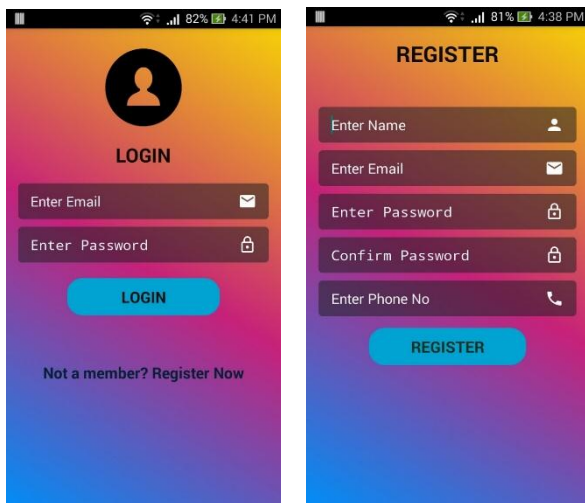


Fig -2: System flow Diagram

SCREENSHOTS:



4. CONCLUSION

This system is regarding offline data streamer for that Raspbian OS platform is being used. It is developed to help the students present in the college to view or download any data which is loaded using Raspberry pi by the admin. The users should have the android application in order to get connect to the system through Wi-Fi feature which is provided by Raspberry pi. Thus, after being connected through Wi-Fi, users are able to access through data and can even download the data to view it offline. This data includes training videos, educational books and important notices.

5. REFERENCES

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