

# Entaalarm-Implementation

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**Abstract**— Long distance trains often render the passengers distressed and frazzled which can affect them psychologically and physically. In such trains, passengers cannot always rely on full-time internet access or mobile network. During such aggravating times, it will be a blessing in disguise to have access to recreational services where internet is dispensable in proposed system. Many such systems are already implemented. It will be worth to attempt a similar endeavour in trains. We will strive to provide entertainment services such as quotes, music and videos through a wireless network in the trains. In addition to the recreational solutions, we also propose an alarm alert feature. We believe long distance journeys should be made as enjoyable and delightful as it can be humanly possible.

**Keywords**— Entertainment in Trains, Alarm Alert, Offline data access, Raspberry pi and Android interfacing.

## I. INTRODUCTION

Mobiles have become intrinsic segment of day-to-day life. Everything has been made possible using that small portable and competent gadget. So it is hardly surprising that mobiles have gained paramount importance as a primary source of entertainment and recreation for people from all walks of life irrespective of age. Passengers boarding long distance trains are often fatigued and weary from the journey. Such journeys can create psychological stress among the passengers which makes them cranky and fussy. To make long journeys in trains, more endurable and bearable, we proposed to provide recreational and entertainment services. Passengers can access these recreational services in their android mobiles freely.

The entertainment and recreational facilities include:

- Music
- Images
- Videos

We will strive to make our mobile application offline by providing our very own wireless network. To facilitate offline mode, we propose introduction of hardware and software interfacing. In our proposed system, the raspberry pi will be media server and android devices as its clients. Raspberry pi will act as hotspot and android devices will communicate with it. Passengers will be able to access data on their phones without needing the internet. A simple user friendly application interface will help passengers to choose the entertainment services of their fancy.

Besides these services, we plan to add a special feature of alarm alert. Passengers will set their source and destination in

the application and the application will notify them on arrival of the destination. This will be most useful when destination of passengers arrive at odd times. The paper will elaborate our inspirational literature survey in the related work, followed by system architecture of our proposed system and a brief sketch of our ambitious modules.

## II. RELATED WORK

### A. Raspberry Pi:

The device used in the proposed system is Raspberry Pi 3 which is the third generation Raspberry Pi. It has replaced the earlier version of Raspberry Pi 2 Model B in February 2016. When compared to the Raspberry Pi 2, it has following features:

- 802.11n Wireless LAN
- Bluetooth 4.1

Similar to Pi 2, it also has following specifications:

- 1GB RAM
- 4 USB Ports
- 40 GPIO pins
- Full HDMI port
- Ethernet port
- Combined 3.5mm audio jack and composite video
- Camera interface(CSI)
- Display interface(DSI)
- Micro SD card slot
- 3D graphics core

To work with Raspberry Pi, an operating system is required. We have used NOOBS (New Out Of Box Software) install manager for the Raspberry Pi. The NOOBS setup is available on the official website of the Raspberry Pi organization [5]



Figure 1-Raspberry Pi 3

### B. Entaalarm [1]

This paper proposed that multiple users will be given concurrent access to the data in the android application directly from the Raspberry Pi. This gave remote access of the Raspberry Pi to the users which reduce the performance of the system and make it less efficient. The shortcomings of the approach for the proposed system have been overcome by the new approach in the implementation.

### C. In-flight entertainment system: State of the Art and Research Directions [2]:

This paper highlights the entertainment system in long duration flights to heighten comfort level of passengers. The confined surroundings of the flights can cause physical and physiological agitation. The authors of this paper conducted a comparative research of current in-flight entertainment systems. Further, they delved into the state of the art of related systems and empowering technologies that could allow ambient-adaptive system to provide personalized recreational services to decrease the passenger's physical and physiological agitation. This paper inspired us to think of an entertainment and recreation mobile application for similar reasons in long journey passenger trains.

### D. Android based home automation using Raspberry Pi [3]:

The objective of this implementation was to control home appliances through android devices using WiFi as communicating protocol and Raspberry Pi as server system. The authors planned to create an interface for the android device that will allow the users to establish connection with the Raspberry Pi server. The Raspberry Pi server will be interfaced with a relay circuit board which will in turn control the home appliances. The connection with the server helps the user to choose the necessary home appliance. The Raspberry Pi server will communicate with appropriate relay. The authors also featured other implementations of home automation such as.

- Home automation based on Java
- Home automation using GSM
- Home automation using Zigbee

However, they preferred android based home automation due to obvious reasons of mobility, portability and other wide range of credentials of android devices. The proposed system of the authors provides scalability, security, authentication and flexibility. This technical paper encouraged us to design our proposed idea using Raspberry Pi as media server and android devices as its clients.

## III. IMPLEMENTAION

Mobile devices based on android operating system are popular and broadly used. We chose android as our target platform because of its open source nature and easy community support.

The implemented system is a client-server application and it consists of three main components:

- Android mobile phone
- Raspberry Pi device.
- Router

The design of the system enables the passengers to access the wireless network of the raspberry pi device and use the recreational services offered by the application in their own phones.

According to our system, the raspberry pi device will act as a media server and the android supported mobile devices as the clients.

The main aspiration of this system is to provide offline access to the passengers, meaning the passengers do not have to connect to Internet to run our application.

The key advantages provided by proposed system are:

- Nifty content for all age groups
- High availability
- Good performance for concurrent users
- Reliability
- Operability in offline mode

### A. SYSTEM ARCHITECTURE

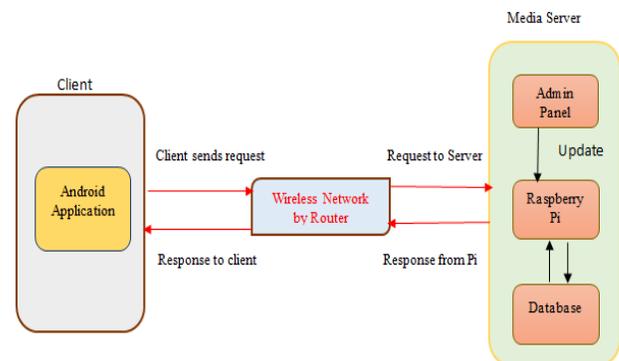


Figure 2-System Architecture

Our system will be implemented using a Client-Server architectural style. The main components of the proposed system are:

- Media server
- Android application
- Router

In our system, there will be many android phones connected to the server (Raspberry Pi) through a wireless network provided by the router. The communication between the server and the client takes place in a request- response manner. The data storage is accessed by the server whenever a client request is placed.

With reference to [1], the new approach promises better performance by transferring the data required by the user to the android application. This is made possible by hosting the data in the media server. Apache service will be used to host the jsp pages and required data will be displayed to the passenger accordingly. This reduces the traffic of the file transfer from the Raspberry Pi to the application.

The major modules of our project are:

- A. Android User Interface
- B. Media Access in Android Application
- C. Media Access from Raspberry Pi through Router
- D. Alarm Alert in Android Application
- E. Uploading media in Raspberry Pi

Following are the Modules of Proposed System:

1. *Android User Interface:* The application opens with Login page which will accept train number and the current date as password.

As raspberry pi is same for a train the application should accept both up and down train numbers as valid input. Date is used to create dynamic password each time the passengers logs into the android application which offers more security over static password.

After passenger clicks on Login button, a toast will be displayed to ascertain whether login was successful. After successful login, passenger will be directed to home page. On the home page, if wifi is disabled then a dialog box will appear to convey the passenger to enable to the wifi. The home page consists of logo on top continued with 6 icons for:

- About the application
- Alarm
- Videos
- Music
- Photos
- Enable Wi-Fi



Figure 3- Android Login Page

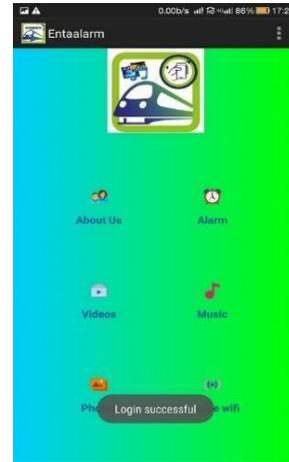


Figure 4- Android Home Page

1. *About Us:* On clicking this icon, it will summarize the purpose of the application

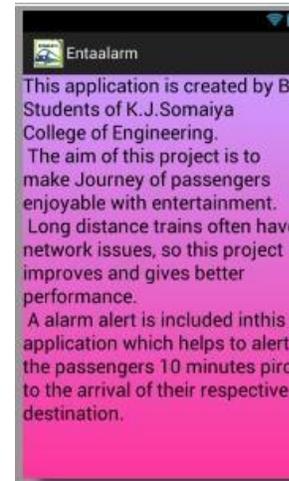


Fig 5- Android About Us Page

2. *Enable Wi-Fi:* When user clicks on this icon, wifi is enabled if it has been disabled and a dialog box will display router information. The same icon will be used to disable wifi.



Fig 6- Android Wifi Enabled



Fig 7- Android Wifi Disabled

The explanation of remaining icons will be given in the following modules.

2. *Media Access in Raspberry Pi:* Three media icons appear on the home page-

- Videos
- Music
- Photos

When user clicks on Photos, a dynamic list of image titles appears through WebView. WebView helps to view HTML pages in the application itself instead of using the browser. When the user selects a particular image title, chosen image will be viewed in the application. Similar process will be followed for the icons of Videos and Music.

3. *Media Access from Raspberry Pi through Router:* The android application, Raspberry Pi and the Router share the same network. Apache runs in the background. The entire data including admin pages, client pages and folder for storing media is available in “/var/www/html” location of raspberry pi.

4. *Alarm Alert in Android Application:* On clicking the Alarm icon, a new activity with drop down of source and destination station and the button of Set Alarm is invoked. The user should enter source and destination to set an alert. The application will run a function to set the system clock.

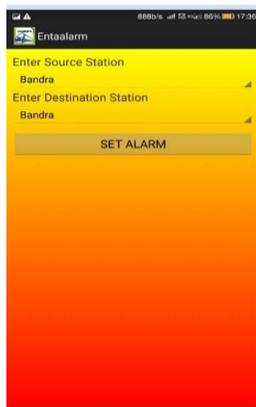


Fig 8- Android Alarm Default

In the background a database is created with source, Destination and arrival time of the destination station.



Fig 9- Android Set Alarm

The Set Alarm function runs the inbuilt clock application in the passenger’s mobile and an alarm is set 10 minutes prior to the destination arrival time.



Fig 10- Android System Clock

If the train does not stop at the destination selected from the drop-down, a dialog is generated to indicate error.



Fig 11- Android Alarm Error

5. *Uploading media in Raspberry Pi*: A jsp page is created for the admin to upload various media in the Raspberry pi. The first step is to authenticate the admin.

After successful login, a page will appear with three links for music, photos and videos. On selecting any of the links, a page will be displayed to select the respective media from the admin's computer files using the Browse button. Next, the Upload button is clicked and the title of the media is stored in the database on the media server. The original files are stored in the folder mentioned statically in the code.

#### IV. CONCLUSION

The implemented approach offers better system performance than the proposed approach [1]. We have attempted to create a cheaper and economic entertainment system which can be installed in long distance trains similar to flight entertainment system [2]. We have endeavored to make long journeys for the passengers as rejuvenating and refreshing as possible.

#### V. FUTURE SCOPE

We envisioned our entertainment system for a single train on a small scale. However, our system can be up-scaled to

multiple trains travelling in different directions. More recreational services besides the ones mentioned above can also be added.

This application has more scope for innovation and scalability. The availability and flexibility of the system can be improved by using more advanced hardware. All these features will increase the complexities of the current system. However, the journey experience of the passengers will always have first priority.

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