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ENTAALARM

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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

1. 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

Fig 1-Raspberry Pi 3

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2. In-flight entertainment system: State of the Art and Research Directions [1]: 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.

3. Android based home automation using Raspberry Pi [2]: 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
- Home automation using SMS

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.THE PROPOSED SYSTEM

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.
We propound our concept to be implemented as a client-server application. The proposed system consists of two main components:

- Android mobile phone
- Raspberry Pi device.

The design of the system will enable the users 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

SYSTEM ARCHITECTURE

Overview:

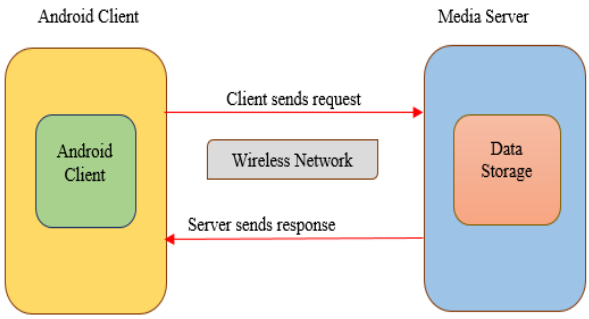

Fig 2-System Architecture

Our system will be implemented using a Client-Server architectural style. Client-Server architecture is a producer-consumer computing architecture where the server acts as the producer and the client as a consumer. The server houses and provides high-end, computing-intensive services to the client on demand. These services can include application's access, file sharing, storage and direct access to the server's raw computing power. Client/Server architecture works when the client device sends a resource or process request to the server over the network connection, which is then processed and delivered to the client. A server can manage several clients simultaneously.
The main components of the proposed system are:

- Data storage
- Media server
- Android phone

In our system, there will be many client phones connected to the server through a wireless network. 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.

The major modules of our project are:

- Android UI
- Media access in Raspberry Pi
- Connect App and Raspberry Pi
- Media access in App
- Alarm Notification

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Following are the Modules of Proposed System:

1. **Android User Interface:** We aim to make the application interface easy and user-friendly. User will get connected to the wireless network and land in the main menu page. On the main menu page, the user will find several options such as media selection, view images, play songs, watch videos and set an alarm. These options define the functionalities of the application and help to serve its purpose.
2. **Media Access in Raspberry Pi:** We introduce raspberry pi 3 model B in this module. The product brought from the market is devoid of operating system. Hence we will install operating system suitable to the project requirements in the device. Instructions to install most popular operating systems are provided in the official online documentation of Raspberry Pi blog. We shall probe into different media formats which can be supported by various operating systems. For the unsupported media formats we shall install necessary applications on the sd card of the device. Media data will be stored in the raspberry pi.
3. **Connect App and Raspberry Pi:** The android app should connect to the Raspberry Pi. Raspberry Pi should be capable of supporting multiple and concurrent users simultaneously. To increase number of connected devices, we can use repeater. Connection to the wireless network will include authentication of the user in the android application. Once authenticated, the user can freely avail of entertainment services.
4. **Media Access in App:** User will be able to watch images of quotes, music and videos from the selected list in the app seamlessly. The media data will be updated by the developers periodically to improve content quality of the application.
5. **Alarm Notification:** The user should enter source and destination to set an alarm. The application will run a function to set the system clock.

IV. CONCLUSION

We have endeavored to encapsulate our humble idea and overview of implementation in this technical proposal paper. The plan of action can vary depending upon the path which actual implementation takes. But the basic idea of what we expect from our system remains unchanged. We hope to successfully implement the concept in its entirety and benefit the distressed train passengers.

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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