ASHESI UNIVERSITY COLLEGE

RADIO AND TELEVISION APPLICATION (RNTAPP)

By

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APPLIED PROJECT

Declaration

I hereby declare that this dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:………………………………………………………………………

Candidate's Name:………………………………………………

Date:…………………………..

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by Ashesi University College.

Supervisor's Signature:………………………………………………………………………..

Supervisor's Name:……………………………………………….

Date:………………………………..

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Abstract

In Ghana, many media houses, both radio and television, have sprung up and thus have increased the level of competition amongst them. Advertisement is one area where media houses try to have an edge over their competitors. Some media houses advertise their programs in newspapers whiles others do so on billboards. However these methods of advertisement are expensive and media houses cannot do it as often. Media houses also advertise programs that involve the participation of viewers and listeners such as commenting on programs and voting. Both of these activities involve viewers and listeners memorizing some name or code of some sought which creates a problem. In the case of commenting on programs, viewers and listeners have to memorize social media profile names of the media house they are commenting into. Voting for nominees of reality shows for instance also involves viewers and listeners memorizing short codes for their preferred nominee. Another problem is created when viewers and listeners miss their favourite programs. The RNTApp is a radio and television application which seeks to address all these problems. Media houses now will only have to upload their program schedules into a database created for them without incurring any costs. Viewers and listeners no more have to memorize social media profile names as it would be provided by the media houses in the application. Voting for nominees is made simple with the names and the pictures of nominees listed instead of memorizing short codes. With RNTApp, viewers and listeners will be able to set reminders of favourite programs they would not want to miss. The RNTApp benefits both

media houses and viewers and listeners and will enrich viewer and listener participation into programs aired by media houses which will also enrich the programs in effect.

Contents

Chapter 1: Introduction

1.1 Background

The media in Ghana is growing rapidly with the introduction of new media houses springing up. The introduction of these new media houses in Ghana has also increased the level of competition amongst them hence the variety of new programs and shows being introduced to the public. These shows involve a lot more participation from viewers and listeners such as calling into programs, sending messages, leaving comments on live programs and voting for nominees in reality shows. To come tops in the competition, few media houses have the financial competitive advantage over others to frequently publish their programs in newspapers or on bill boards to gain popularity by appealing to the public eye. Companies that offer goods and services would also want to advertise their products especially to specific groups of interest. The general problem faced by media houses is to find cheaper means of advertising their programs. The cost of advertising on bill boards and newspapers is not a convenient method in terms of cost. Since lack of finances for advertising program schedules is a problem for media houses. Viewers and listeners too are affected as they find it difficult to find program schedules for media houses. This affects participation of viewers and listeners in media activities since they are not aware of programs and their schedules. Even after finding alternative methods of advertising programs, there is the problem of effectively involving viewers and listeners to participate in programs. There should be more appealing ways of

attracting viewers and listeners to programs that involve their participation than what already exists. Media house viewers and listeners currently participate through social media where they type in the profile names of the media house before commenting. This is done by the participants logging into the particular social media and providing the media house profile name in the search box. Alternatively the media houses provide viewers and listeners with the full url path that opens the particular profile page so that participants directly type that into the url section of their browser. Voting for nominees in a reality show also involves viewers and listeners memorizing a short combination of characters which often includes numbers and alphabets. This short combination of characters is often referred to as a short code and it may be a unique code for each nominee in any reality show. Viewers and listeners thus text this short code of their preferred nominee to a phone number or a keyword in order to vote in any reality show. The problem with this method of commenting and voting is that a regular viewer or listener of a particular program may not know the phone number, social media profile name or short code for either commenting or voting and thus cannot participate. These methods of encouraging participation of viewers and listeners are good but can be significantly improved with alternative and more effective methods.

Presently advertisement is targeted at everyone regardless of who is interested or not. However, it will be in the best interest of the media houses to advertise to those that need the product or the service rather than a whole

sale advertisement. When advertisement is targeted at a focus group, it yields more results for the product and the media house.

The proposed radio and television application which will be called RNTApp is an application that would help sell the media houses even further to the general public. Media houses will get to upload their program schedules in a database for users to access. Android smart phone users will have the opportunity to participate in programs aired by media houses. The radio and television application will make radio and television activities in Ghana more vibrant.

1.2   Objective

The RNTApp will provide users with a platform to choose from a number of media houses that present several program options. The application will be used by the media houses that will be responsible for loading the database with the several program options. This application seeks to address the problems present in existing applications similar to this. There are features that are lacking in the existing application and thus the objective of the RNTApp is to add these features to make the RNTApp stand out. These features include functions that would remind users of future programs by setting reminders set on the phone. The application will allow users to leave comments on programs being aired through their social media. Programs that include voting for nominees will be made simple with the names of the nominees listed, out of which a choice can be made. Adverts that will be

shown will be specific to the preferences of the particular user of the application.

1.3 Overview

Many existing radio and television applications do not have a list of program schedules. Some, however, at best have the list of the media house program schedules which is no different from publishing in newspapers or on billboards. Having a list of media program schedules is equivalent to publishing in newspapers and billboards since viewers and listeners setting reminders automatically. For instance GhanaWaves.com [1], does not have program schedules but only connects the user to the media via the internet thus users have no means of being reminded of future programs. Users however may want to be reminded of a particular program scheduled at a particular time and would require a functionality that would allow them to create reminders on their phones.

Programs have evolved and now depend on participation from viewers and listeners. Reality shows are a kind of program that demand participation from viewers and listeners and voting is one way to get that participation from viewers and listeners. Currently, voting is handled by the telecommunication companies and it involves viewers and listeners memorizing a short code to vote for a preferred nominee. The problem faced by viewers and listeners here is that the short codes have to be memorized before voting can be done. As mentioned above, regular viewers and listeners will not be familiar

with the code and hence cannot vote. When the code is also forgotten voting will not be possible. The voting functionality will enable users have the names of the nominees to be voted for listed. This would present a more user friendly interface for users to participate entirely in the reality show programs.

To encourage more participation, radio and television stations announce phone numbers for calling and for text messages as well as announcing social media profile names for leaving comments. Viewers and listeners would normally have a hard time memorizing these numbers and names and may thus ignore contributing into the program. With the RNTApp, an added function for commenting on programs can be added where viewers and listeners will have the opportunity to directly leave comments on the profile pages of a social media platform. Users will no longer have to memorize profile names since the names are already pre-loaded when the media house is selected. This is important because viewers and listeners can forget the profile name or even make a typographical error in typing out the profile name.

Advertisement in the media is done on large scale by media houses during programs. Advertisement on large scale means that adverts are played on television or on the radio to the general public without considering the interests of individuals. If goods and services are not advertised to an interested target group, sales will not be high. The RNTApp will use the personal information of users through their registration to advertise

specifically to their needs. This is aimed at boosting sales of goods and services advertised by the media houses.

1.4   Motivation

SMS based voting which is normally handled by the telecommunication companies is geared towards promotions. A program can have different nominees categorized under different keywords and short codes. For instance a music competition can have different categories such as 'male vocalist of the year' and 'female vocalist of the year' with keywords identifying each category. Under these categories the different nominees under each category would have different short codes representing them. With the SMS based voting, there are so many codes to memorize if a viewer or listener wants to actively participate in the voting. Designing an application that will enable users simply vote for their preferred nominees with the nominee name listed was the motivation behind this project. In this way users avoid memorizing short codes and keywords for programs that include their preferred nominees and directly vote with the name of their nominees listed.

To encourage viewers and listeners to contribute frequently to programs, media houses continuously announce their phone numbers for calling and text messages. They also announce social media profile names for listeners and viewers to drop comments regarding the program. Memorizing these names again becomes a challenge for users since some users may forget the short codes, misspell the profile names or may not know the profile names at

all until it is announced again. The thought, therefore, of designing an application that already preloads the social media profile name of the media house is very exciting and hence is another motivating factor for this project.

1.5   Expected results and potential benefits

The RNTApp will have benefits for both users – the end users who are users who will use the application on their smart phones and the back-end users who primarily feed data into the database for end users to access on their phones. The back-end users are the media houses and they will benefit by avoiding the high cost involved in publishing program schedules in newspapers every week. Instead of publishing in the newspapers, media houses can load their schedules into a database after which end users can have access to the schedules on their android smart phones. Media houses also will be able to manage adverts and can tell from their database adverts that are selling to the public the most by the number of clicks and views end users make. Voting activities will be also managed by the media houses where they can tell from their database the number of votes for each nominee. The end users who use the application on their smart phones will benefit from setting reminders for future programs of their interest - the reminders will be synchronized with the phones calendar and will send a notification to the user when time is due. Voting becomes easier since nominee names will be displayed in a list and selecting and holding a particular name will complete a vote which can be done once per program.

When a program is being aired or has ended, users will be able to comment on the program via social media such as twitter and facebook. The application will have the social media profile names of the media house and thus users will not have to search or type in the profile name for the particular media house before leaving a comment. End users will enjoy the benefit of receiving only adverts of relevance. The media house may mine the data entered by the end users during registration to advertise to the end users specifically.

1.5 Overview of remaining chapters

Now with the problem outlined in this chapter, the next chapter will discuss how the problem can be solved and how others have attempted to solve it. It will give a detailed background and context of the solution including how the solution is supposed to work. Chapter 3 will focus on the detailed design of the solution and will involve the approach used in tackling the problem. Chapter 4 addresses how the solution works and illustrates its implementation with a walk through of the entire program. Screen shots to aid in the illustrations are important in this chapter and will be provided. Chapter 5 includes an analysis and evaluation of the solution as well as observations from the tests conducted. The final chapter closes with conclusions drawn, recommendation for the present solution and how in the future these recommendations can be added to make the application more effective.

Chapter 2: Review of existing work

2.1   Existing applications

Radio and television applications already exist in the market and are being used. Examples of existing radio and television applications in the android market include "Ghana radio stations and news" also called "GhanaWaves.com" [1], "PCRadio" [2], "TuneIn Radio" [3] and many more. These applications include features such as getting media houses from a database, setting reminders and sending comments to a central website. GhanaWaves.com for instance has a central website where users can comment directly on a program live in a studio or leave comments after a program has been aired [1]. TuneIn Radio has the functionality that allows users to set reminders for a particular program their interested in [3].

The RNTApp has these functions as well. It is capable of downloading the media house program schedule onto the phone as well as setting reminders for programs users would not want to miss. This application however stands out from the existing ones in a number of respects. Unlike existing applications that enable posting comment to a central website, the RNTApp enables users to post comments directly to the media houses social media profile pages. This way the users have a guarantee that their comments will get a response from the media houses since the social media pages are constantly running during the programs to receive and respond to comments. Comments from other users can be read and followed as well, given users more reason to leave comments. The practice of having to write down short

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codes or social platform names just to participate in a program can be avoided. The RNTApp has a voting feature which allows users to vote into reality shows by only selecting their preferred nominee. Although this feature is being handled by telecommunication companies, the aspect of memorizing short codes before voting is a bother and is replaced by just clicking the name of the nominee. Also the cost of voting via http compared to voting via sms is extremely cheaper. The voting feature is network independent since it uses http for connection.

The RNTApp has features that already exist such as downloading schedules and setting reminders. The system requirements below show the complete features of this application.

2.3   Functional requirement

- Application must download schedule from media houses online
- Users should be able to set reminders on their phones
- Application allows voting by users
- The program should enable users to access social media platforms of media houses directly without typing media house social media profile names.
- New users must be registered
- Application should be able to perform focus group adverts to end users
- Should supply multiple media houses

2.4 Non-functional requirement

- Application must be connected to the internet

- Application is supported by Android platforms versions 2.0 upwards

- There should be meaningful feedback from the system after every action especially when there is a delay in reading and writing to the database.

- Navigating through the application should be simple to learn and use

2.5 Use cases

This application includes 2 major actors – the end user and the media houses. The end user is the client that uses the application on their smart phone. The media houses are back-end users responsible for data-entry (entering schedules, show names and nominee names). The media houses also monitor and collate all results for voting activities.

Chapter 3: Design

3. 1 Technology and tools used

There are various tools used to implement this application. One tool can be used entirely for the application or a mix of the tools can also be employed. The client end user interface can be implemented as a web application which can have a mobile version. For strict mobile applications, J2ME, python or android can be used to design the user interface. Android however is ideal because it has a very appealing interface that already has features such as menus that are already designed.

The web part of the application could be designed as a mobile application as well but since it involves constant data entry and monitoring, it is best to have it as a desktop web application. It can be launched on bigger screens for efficient data entry and monitoring when designed as a desktop web application.

3.1.1 System architectural design

The architecture of the system is made up of different models and layers that interact with each other to achieve success in running the application. Fig 3.1 shows the different layers which include the graphical user interface layer which is also made up of the end user view and the back-end user view, the middle ware and the database model.
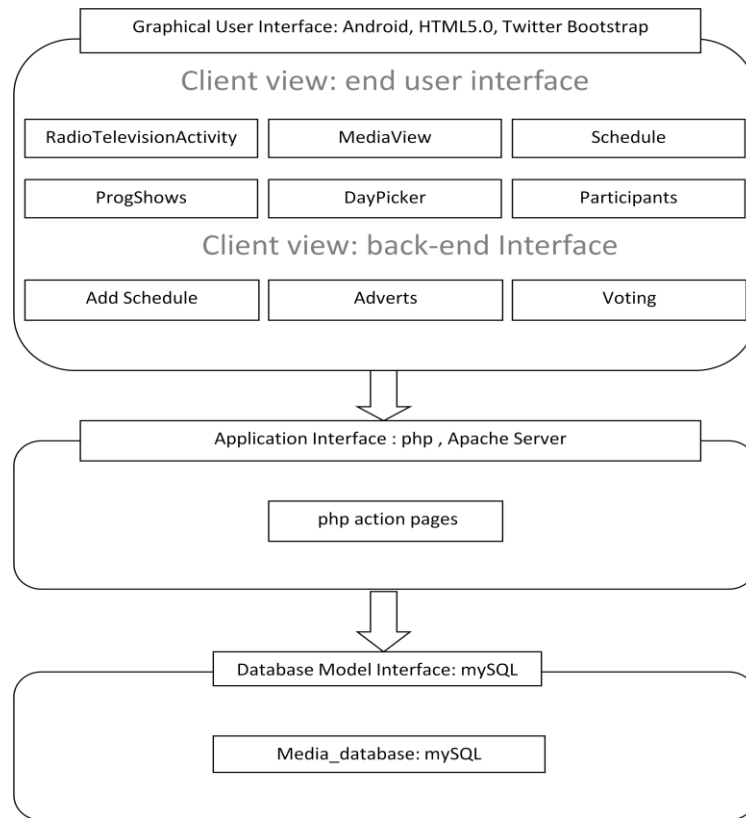
Figure 3.1: System Architecture

3.1.2 Interface design

The graphical user interface involves two different views – one for end-users and the other for back-end users. The end user view is on the screen of the user's phone and the back-end view is a small web application for the media houses. The two user views interact with the database layer using the various applications in the application layer as a medium of communication (Fig 3.1). The user interface design for the end users is designed to read data from the database. The only activities that write to the database is commenting and voting. The user interface for the back-end users is designed both to read and write from the database. Writing to the database

for the back-end users involves solely data entry activities whiles the read from the database monitors the activities of the end users.

3.1.3 Application design

The application's client graphical user interface which runs on the smart phone is designed with android java. Using the java programming language the application interfaces with php which is the server side script that links the end user interface with the database. The php script incorporates the use of mysql queries to interact with the mysql server database version 5.5.8 [4]. On the web side where the back-end users perform data entry mainly, the web interface is designed using HTML version 5.0 with the help of another tool called twitter bootstrap version 2.3.1 [5] which is used in the styling of the web interface. The web interface also works on a php script back end that also interacts with the mysql server database to enter data and fetch data.

To use twitter bootstrap, a set of style sheets in a folder called bootstrap is downloaded to the localhost folder, 'htdocs' on the local machine. In the head section of the HTML file, a link is added to include one of the style sheets 'bootstrap.css' (fig 3.2).

```
<head>
    <title>Add schedule</title>
    <link href="bootstrap/css/bootstrap.css" rel="stylesheet" type="text/css"/>
</head>
```

Figure 3.2: including twitter bootstrap style sheet

After the link for the style sheet has been added, the desired element to style calls a particular class name that could be associated with the element. In some cases all common elements have a unique style applied to them. Fig 3.3 is a sample of the twitter bootstrap style sheet that styles buttons, inputs or textfields, selects or drop downs and textarea's.

```css
button,
input,
select,
textarea {
  margin: 0;
  font-size: 100%;
  vertical-align: middle;
}

button,
input {
  *overflow: visible;
  line-height: normal;
}

button::-moz-focus-inner,
input::-moz-focus-inner {
  padding: 0;
  border: 0;
}

button,
html input[type="button"],
input[type="reset"],
input[type="submit"] {
  cursor: pointer;
  -webkit-appearance: button;
}
```

Figure 3.3: twitter bootstrap style sheet

3.1.4 Database architecture

The database layer has a number of related tables under a database called "media_database" which takes care of all the media house information and

includes six tables – 'media_houses', 'media_schedule', 'nominees', 'voting', 'adverts', 'user_info'. Below in Fig 3.4 are the tables in the database.
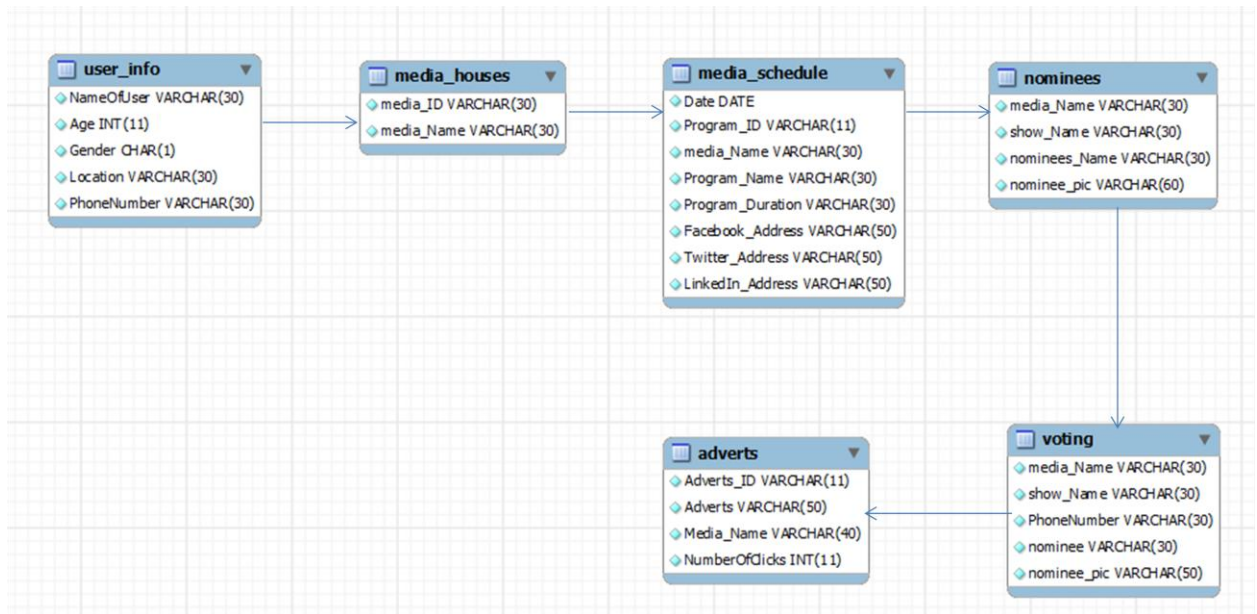
Figure 3.4: Database Architecture

3. 2 Platform

The RNTApp runs on android versions 2.0 upwards. The android version 2.0 code named 'Eclair' is built on the Linux kernel 2.6.29 and is upward compatible with versions higher than 2.0 [6]. A reason for choosing this version for the application was to enable many android phones to run application as versions 2.0 and higher form the majority of android smart phones used.

The Apache HTTP web server is an open-source software released under the Apache License which is available for a wide variety of operating systems including Microsoft Windows which is the operating system that runs on the computer used for building the project. The Apache HTTP web server implements common server-side programming languages such as Perl, Python, Tcl and PHP [7].
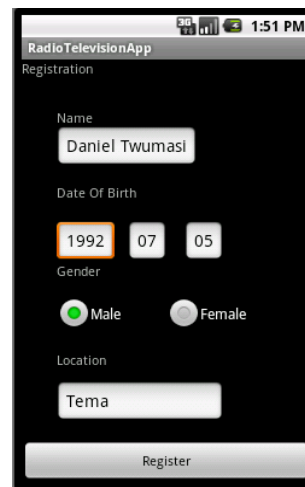
Chapter 4: Implementation

4.1　Solution Implementation

4.1.1 End user interface

Registration View

New users will have to provide certain details about themselves in the registration view. This information will be stored in a database and will be used to advertise to the user. The users name, age, gender, location form the users' preference which advertisements depend on to target its users.

Figure 4.1: Registration

Home Screen

The application is divided into a radio and television section both of which have the same structure. Either of these selections pulls up a list of available media houses under their respective categories.
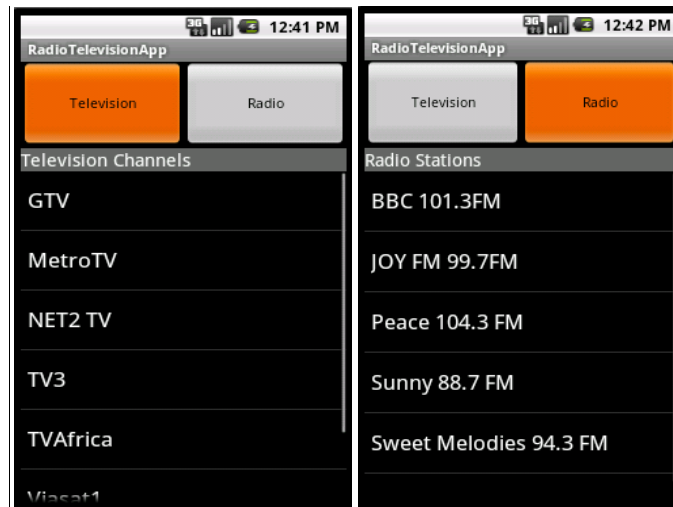
Figure 4.2: Home Screen

Tabbed Layout

Any choice of media house from the home screen opens a tabbed layout where there is the option of seeing today's program as the first tab. The next tab has a date picker for selecting any program schedule. The final tab includes a list of all programs from the media house. The programs include regular programs that may require users to comment and also programs that require the users to vote as well as comment. The last tab has an advert button below that opens a screen for the adverts shown to the user..
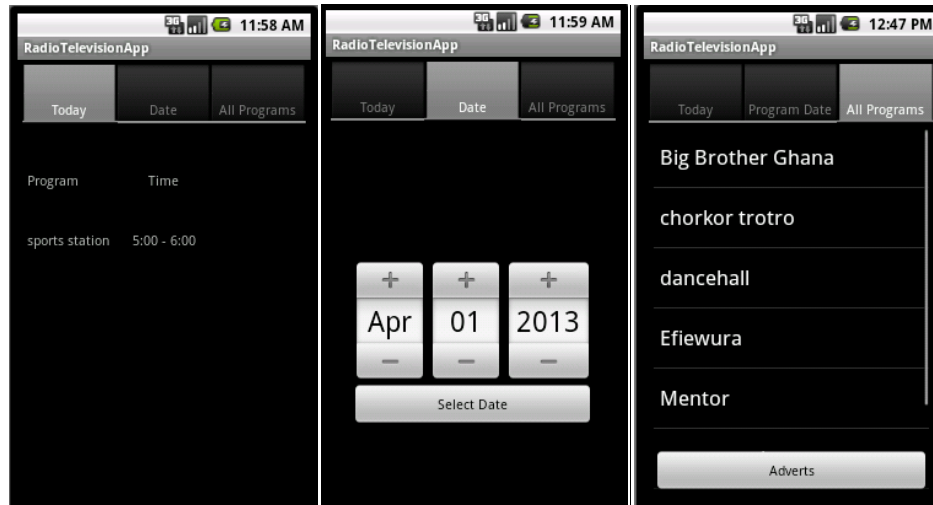
Figure 4.3: Tabbed Layout

Context menu Options

From any of the tabs, selecting and holding any listed item pops up a context menu for commenting, setting reminders, a cancel option for no action performed and for some programs an option for voting is provided (Fig 4.4). The end user interface reads data such as the program schedules, nominee names and adverts entered into the database by the media houses. The voting option opens a screen with a list of nominees for that show clicked to activate the context menu. Holding and selecting any of the nominee names pops up another context menu. The context menu has an option for voting for the selected nominee. Selecting this option completes the vote for the user for that particular show - voting is done once per show. The database records the phone number of the user after every vote and checks in the database whether the user's number already exists with a particular show

name. If it is the show name the user is voting in again, the action would not
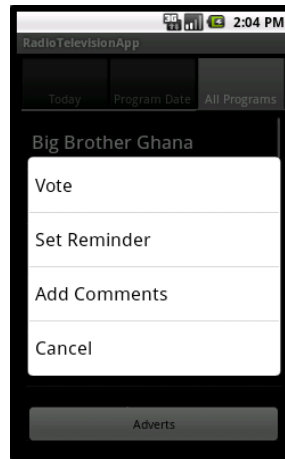be allowed (Fig 4.5).

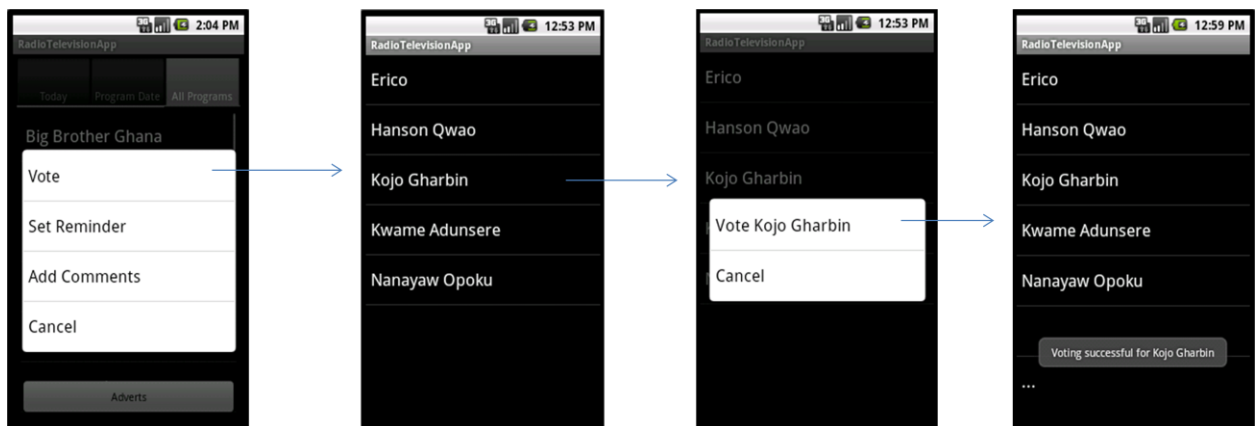Figure 4.4: Context Menu Options

Figure 4.5: Voting process

The option to set a reminder sends a reminder notification to the user 5
minutes before the start of the program so that the user has enough time to
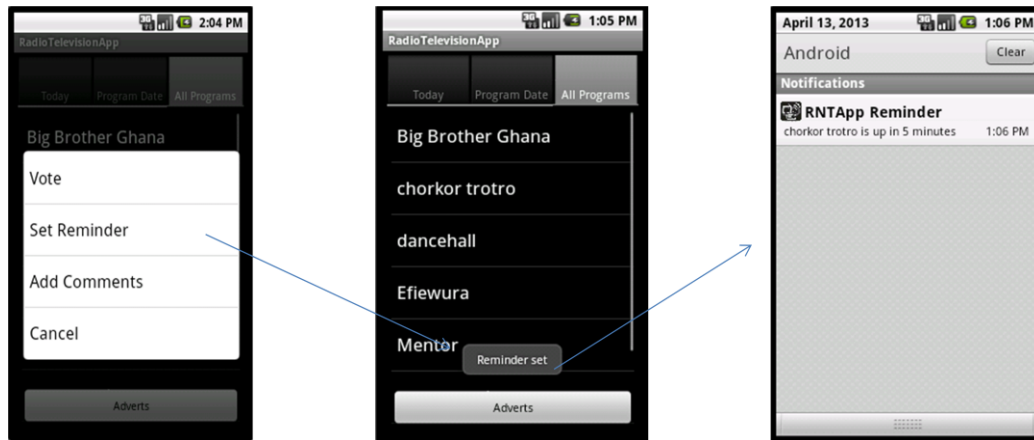prepare for the program (Fig 4.6).

Figure 4.6: Set reminder process

The 'Add Comments' option opens a screen with social media buttons. Each button has the full url path of the profile page of the particular program loaded from the database. Clicking on any of the buttons opens the programs profile page directly. Commenting can be done successfully.
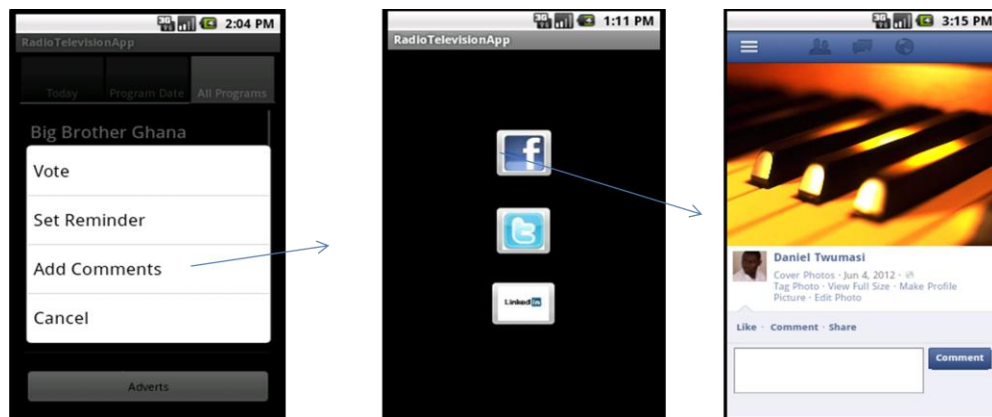

Figure 4.7: Add comments process

The adverts button opens a screen where various adverts are shown to the user. These are adverts from the database that have id's that match that of the user's details. Therefore the adverts on this page are relevant to the user of the application according to the id of the user's details that is generated

after registration. Clicking on one of the adverts opens another screen where the advert appears alone and can be seen clearer than when it was listed (Fig 4.6).

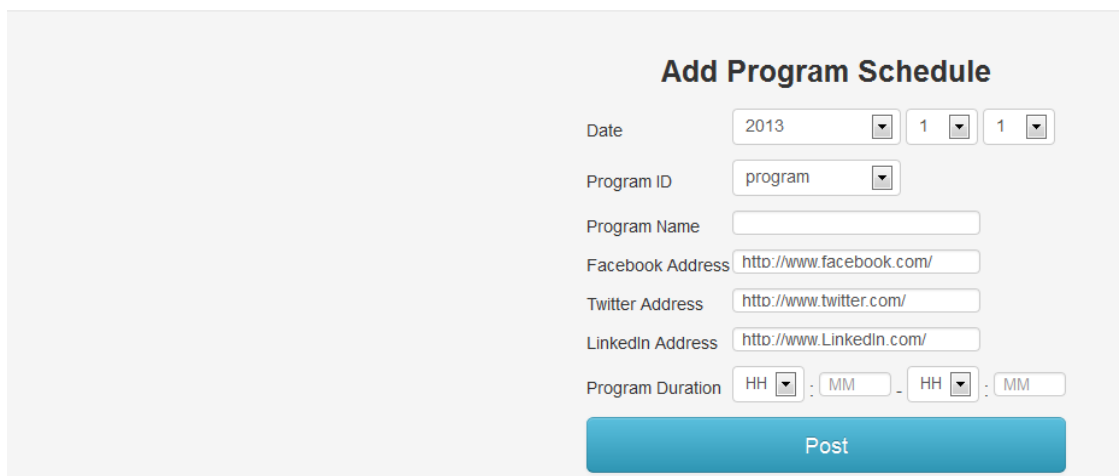Figure 4.6: Adverts process

4.1.1 Back-end user interface

The back-end user interface is built for each media house to monitor their users. It is a web based interface made up of menu items such as 'Add Schedule' for adding new program schedules, a menu item for voting where voting activities, specifically collating voting results are monitored. There is also a menu item for Adverts where the performance of an advert is monitored by the number of clicks users make to the advert. The comments menu item loads the most recent comments from the media houses' social media profile page.

Adding a program schedule

To add a program schedule, the media house selects the date, selects a program ID, 'program' or 'show'. Program represents a regular program without any nominees to vote for whiles 'show' represents a program or a reality show that involves nominees and voting. Selecting 'show' provides additional fields for inserting nominees for the particular show. The media house is able to provide the url path for the social media profile of the particular program being entered into the database. The program name and the duration of the program can also be entered. Since the web interface is built specifically for the individual media houses, information or entries from one media house cannot be seen by any other media house. Although the database has the names of the media houses, each media house has its own interface with its own information.

Figure 4.5: Adding a schedule

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Voting

The voting interface is a collation of voting results from the end user's actions (Fig 4.10). It includes the name of the user as well as the phone number of the user that voted. To use the phone number of a user for an application, android has permissions that should be added before that functionality can work. This permission statement is added to the android manifest file to enable the application read the phones state.

"`<uses-permission android:name="android.permission.READ_PHONE_STATE"/>`"

To read the phone state the TelephoneManager class is called as seen in the code below

```
        TelephonyManager phoneManager = (TelephonyManager)
    getApplicationContext().getSystemService(Context.TELEPHONY_SERVICE);
            phoneNumber = phoneManager.getLine1Number();
```

Add Schedule   Voting   Adverts   Comments

Voting Results

Program Name Banking Awards ▼

PHONE NUMBER	NOMINEE
0540023458	Fidelity Bank
0203994832	UT Bank
0542998767	UT Bank
0274775643	UT Bank
0263348903	HFC Bank
0243758495	HFC Bank
0543948594	Fidelity Bank
0549993894	Zenith Bank
0203383494	Zenith Bank

Figure 4.10: Voting interface

Adverts

Adverts are shown to users using the details entered during registration – name, age, gender and location. In the 'adverts' table in the database, each advert is stored with an id that has information of the user's details. So for instance an advert id such as 'MA50T' describes an advert suitable for male users 50 years and above living in Tema. Another advert id 'MA18D' describes an advert suitable for male users above the age of 18 living in Dansoman. Therefore when users register, the application takes their age, gender and location and returns an id that is compared to the id's in the 'adverts' table. When a match is found in the database, it shows that advert to the user with that particular id.

The gender detail returns either an "M" for males or an "F" for females. The age of a user has a range of ages of users such as users below 18, above 18, between 25 and 35, between 40 and 50 and above 50. These ranges return id's like B18, A18, 25-35, 40-50 and A50 respectively. Then finally the location detail returns specific id's for the location a user enters. For instance the location 'Tema' returns 'T' as an id. The id's returned by the three user details are concatenated to form the id that is cross checked with the id's in the database 'adverts' table for the suitable adverts to be shown to the user.

The advert page on the web interface is responsible for displaying the adverts with a record of the number of clicks the adverts has from the several users. This is to track the performance of the adverts (Fig 4.9).

Add Program Schedule

| ADVERTS LABEL	ADVERTS	NUMBER OF CLICKS
AITI-KACE	Broaden your knowledge this vacation by applying to the 8 week IT program at AITI-KACE. Pay in installments for a period of 3 weeks. Location: Accra Ridge. Tel: 0546722390	32
Ideal College	Ideal College Transform your grade in 10 weeks Registration fee is only 300 cedis Call 0202929293 0243556457 0571112308 "Ideal College how can you fail"	17
Learn to play an instrument	Learn to play an instrument in 3 months. Spend vacation times learning to play an instrument of your choice Contact us: 0248883499 Email: dskt300@gmail.com	45

Figure 4.9: Adverts web interface

Comments

When users comment on programs from the social media, not all the comments are read or even seen during the program. Comments that are read are flagged as 'read' and those not read or seen remain 'unread'. Therefore, the comment tab is responsible for displaying unread comments from the social media platform. Anytime the program is aired again, the presenter is able to access the unread comments from the last time. This way every comment is attended to for any necessary feedback from the presenter or other viewers and listeners.

4.2   Implementation issues

In designing a ListView with one column for one list item per column was relatively easy compared to a ListView with 2 columns for an item in each

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column. The challenge was that one item in one column matches to an item in the second column of the same row. The initial intention was to put two ListViews side by side but to synchronize one ListView with the other was challenging. The idea was to make each row clickable thus the essence of synchronizing one column with the other. To solve this, a hash map data structure with a key and value pair was used. The hash map used items in the first column as the keys with their corresponding values in the second column (fig 4.8). In the simple single column ListView, an ArrayList is used to populate the ListView with an array as the object. The double column ListView incorporates the use of the ArrayList but with a hash map object.
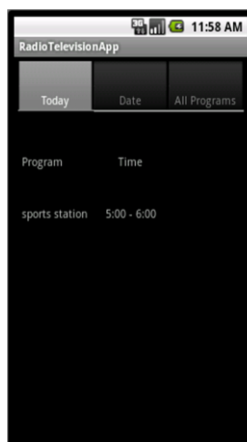
Figure 4.6: Hash Map solution

Chapter 5: Testing and Evaluation

5.1   Testing and results

5.1.1 Phone user interface testing

FUNCTION	TEST RESULTS
Downloading media houses	Users commended the interface as simple to understand
Downloading media program schedule	The tabbed layout appealed to users but the naming of some of the tabs was not straightforward. Schedules also did not look clickable even though they are clickable.
Setting Reminders	On a short click, a toast that tells you to set reminder on long click produced good feedback from users. Using the datetimepicker to set reminder was simple to use.
Adding comments	Users commended the idea of not finding social profile names before leaving comments.
Selecting a date	The tab title "Date" confused users. Also the datepicker should have been disabled so users cannot select from that but should click on the select date button before selecting a date. Users struggled with the datepicker.
Voting	Voting was made too simple and users wanted more confirmation than the toast for voting.

	Users suggested the use of loading gif images to show some activity after voting.

<p align="center">Table 5.1: End user testing</p>

5.1.2 Back-end user testing

FUNCTION	TESTING AND RESULTS
Add Schedule	Users complained that adding a program schedule by typing still involved some work.
Voting	While some users did not see the use of the voting page, others thought it was a simple way of collating votes.
Adverts	Users suggested they will be happy themselves to track the performance of their adverts in the public.
Comments	Users commended the idea of reading recent comments from the web application that is loaded from the social platform.

<p align="center">Table 5.2: Back-end user testing</p>

Chapter 6: Conclusions and recommendations

6.1 Conclusions

The objectives of the RNTApp were to satisfy two parties – the smart phone users and the media houses. Each of these users had a number of objectives that were to be satisfied for a successful application. The application will enable end users develop some interest in television and radio programs indirectly by using this application on their phones. The interest of users in television and radio programs will increase because of how easy the application has made commenting. Back-end users, the media houses, will now find it easy to add new programs which can be seen by the public through the RNTApp. With this application, companies can track the performance of their adverts so that if the performance is poor they can work on it.

6.2 Recommendations for future work

The RNTApp can be extended to connect to internet radio or internet television when a media program is selected. Better still when a program or a schedule is selected, an additional menu item should exist that allows the users to connect to the media – either the radio or the television. The application can have more advanced ways of crowd sourcing so that the data can be mined for various activities other than advertisement. For instance data can be collected from social media activities such as twitter so that a

trend is defined for the kind of programs a user may listen to. With the defined trend, a reminder or notification can be automatically set for the user or better still suggestions of the programs could be displayed for the user to choose from. Also using crowd sourcing methods, the application should be able to automatically locate the user and advertise products, goods and services located in that area to the user as a notification. The notification should open a page where all the products, goods and services for that area are listed. Media houses can take a step further and prompt the respective companies whose adverts are played about the performance of their adverts. The prompts can be sent through sms or a notification to the companies. These recommendations can be added to the application and make it function effectively benefiting both end users and back-end users.

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Appendix

SCENARIOS

The scenarios illustrated below describe categories of users of the RNTApp. The categories of users are divided according to the specific functions they expect the application to perform. Each scenario describes a common question first time users of the RNTApp would ask. With the help of the use cases the various questions are addressed.

a. End User (User A)

User A has missed the "mentor show for 2 weeks running because it just escaped him. The next time however he uses the RNTApp to remind him. He opens the app, registers as a new user with his name, phone number and other details. After being registered, the app launches and he can access the media houses. He selects say 'TV3' and then holds on the "mentor show" where he can now set his reminder. Figure 1 summarizes the user A's functions
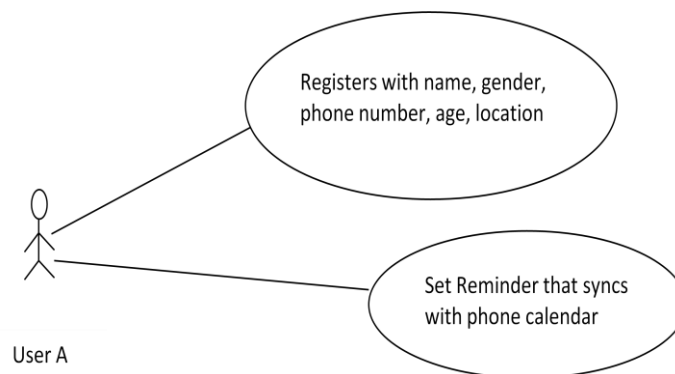

Figure 7: User A setting a reminder

b. End User (User B)

User B is already an existing user and wants to vote for say 'Erico' of the 'mentor show'. He launches the program selects 'TV3', goes to the All Programs tab and holds and selects the mentor show and then chooses "Vote". He then selects and holds 'Erico' and then votes.
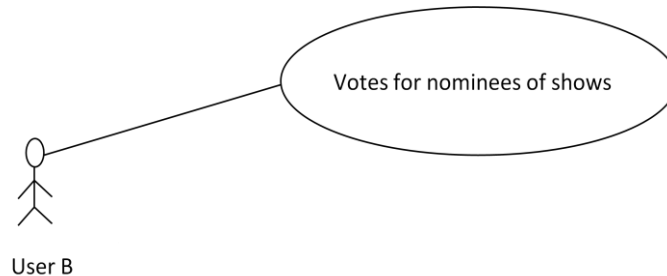

Figure 8: User B voting

c. End User (User C)

User C is an existing user and wants to comment on the Metro News program. She launches the application, selects 'Metro TV' goes to the 'Metro News' schedule and holds and then selects 'Add comment'. She selects facebook and adds her comment without putting in Metro TV's facebook Name.
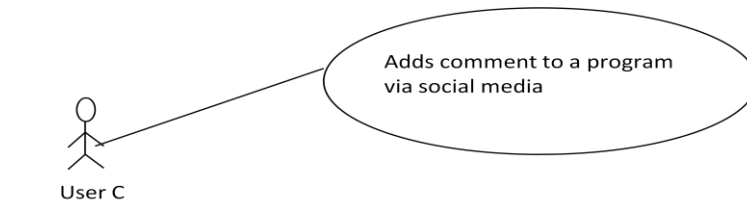
d. Back-End User – Media Houses

Media House A wants to load its new program into the database. They launch the back-end web application and click on the 'Add Schedule' menu item where they can load the new program. They go ahead to load the nominee names for the new program. Since the program involves voting by users, Media House A collates the voting results. Aside the adverts being played on air, there are sponsors for Media House A's new program and these adverts are shown to the end users according to their preferences. From this, Media House A keeps track of the performance of these adverts and gives feedback to the advert owners.
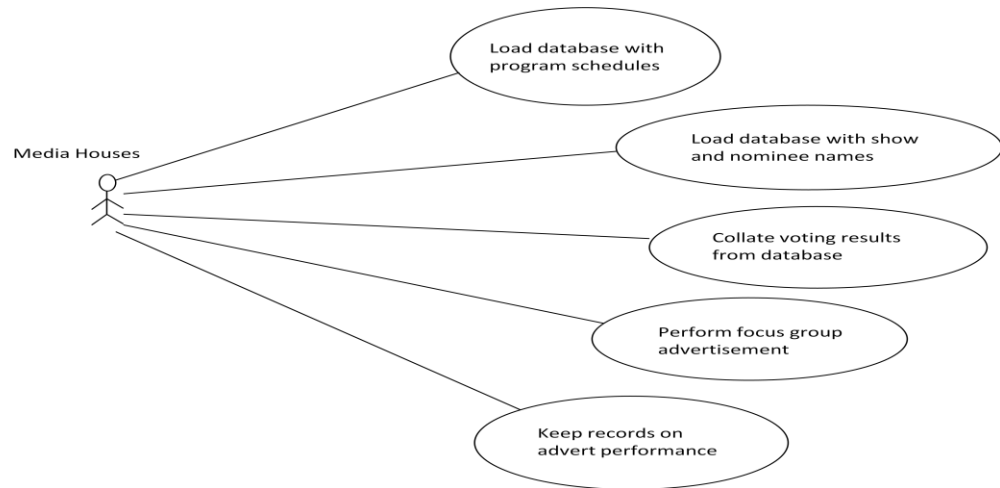
Figure 10: Media Houses Activities