Postgraduate Diploma in Information Technology

IT8x15 Multimedia application development for mobile devices

Assignment 3: Android App Development

Notification system for civil defence emergencies in New Zealand

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Submission Date: 13th Nov 2017

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Introduction

New Zealand has always been a vulnerable island to a lot of disastrous events which so far has caused an enormous amount of damage to the wealth and health of this country (New Zealand Government, n.d.). However, there are a lot of precautionary and prevention measures already present in the form of mobile applications but Government agencies like Ministry of Civil Defence Emergency (MCDEM) who are responsible of sending emergency notifications and help to people are still struggling to find a robust and efficient solution (Zhang, 2017). This document proposes one such mobile application named 'Alert ME' which can be used for emergency notification system in New Zealand and other countries. This mobile application will help users to receive emergency notifications based on the user's location during any type of disasters such as earthquake, fire, tsunami, storm, and volcanic eruptions.

The primary aim of 'Alert ME' app is to provide a quick and effective notification system for civil defence emergencies for New Zealanders and other countries. The purpose of 'Alert ME' app is to notify local people of the countries and all the associated agencies to manage and work in an emergency threat or upcoming situation.

Features of app

Implementation of 'Alert ME' app is divided into two phases: in first phase, only New Zealand people are targeted with basic features described in this section and second phase will cover all countries with some additional features explained in 'Future work' section.

For first phase implementation, the basic features covered of 'Alert ME' app are as follows:

1. It can be used for all states of NZ and works for all kind of emergencies like earthquakes, volcanoes, tsunamis, storms, and fire.
2. The registration feature of the app allows the user to enter his or her personal information like username, password and can add two emergency contacts of close ones.
3. It has a feature to choose one location for alerts which sends the user relevant notifications as per that selected area only.

4. It has a user-friendly GUI such as easy to login and register and for checking the notifications, user does not need to navigate very deep in the app because notifications appear on the home page of the app.
5. It provides helpful information by 'Help' menu in case the user needs to know what he or she should do in case of emergency.

Features completed

Features completed in so far for 'Alert ME' app as described as follows:

1. *User login:* User can login with already registered email id. Validations for wrong or invalid email id and password has been applied in the app.
2. *User registration:* Registration feature of the app allows the user to enter his or her personal information like username, password, email id, country, region and can two emergency contact numbers of close ones.
3. *Location selection:* Google API allows user to choose the location for profile registration. By choosing the location, country and region fields on registration page get filled automatically.
4. *User profile update:* User can update his or her profile later once registered by clicking the 'Profile' option from menu. It will allow user to update username, password, and contact numbers only. User cannot update email id, country, and region.
5. *Emergency contact numbers:* 'Emergency' option on menu allows user to view local emergency number which is populated by latest disaster notification information and two other emergency contact numbers which are added by user through profile registration. This feature also allow user to call on these emergency numbers by clicking the call button next to the numbers.
6. *Help information:* 'Help' option on menu provides information related to necessary action steps to be taken by user in case of any emergency. This page displays types of emergency like earthquake, tsunami, fire, storm, and volcanic eruption. User can get necessary information by clicking of any of these options.
7. *Disaster registration:* Any user, especially Ministry of Civil Defence Emergency Management (MCDEM) can register information about any recent disaster occurred

which would be visible on the home screen of all other users who are in the same location of disaster occurrence.

8. *Disaster update:* In any disaster notification which is already registered and displaying on the home screen of app, the emergency local number and disaster details can be updated by clicking on the notification listed.
9. *Notifications:* Emergency notifications are listed on home screen of the app. Only latest four notifications will be displayed and most recent registered notification will be displayed at the top of the list.
10. *Logout:* 'Logout' option from menu allows user to logout of the app anytime. On opening the app after logout, user can login and access the app again.

Development logs with length of time and tasks

Table 1: Development logs

Functionality	Tasks	Subtasks	Time taken
Login page	Development	UI designing	1 day
		Activity creation	1 day
		DB integration	1 day
	Testing	Testing Login activity	½ day
	Rework	Fixes of issues	½ day
User registration page	Development	UI designing	1 day
		Activity creation	1 day
		DB integration	1 day
		Google API integration (Map activity)	1 day
	Testing	Testing User registration activity	½ day
	Rework	Fixes of issues	1 day
Disaster registration page	Development	UI designing	1 day
		Activity creation	1 day
		DB integration	1 day
		Google API integration (Map activity)	1 day
		Disaster notification update	½ day
	Testing	Testing Disaster registration activity	½ day
	Rework	Fixes of issues	1 day
Menu (Profile)	Development	UI designing (On header layout)	½ day
		Activity creation	1 day
		DB integration	½ day

	Testing	Testing Profile page	½ day
	Rework	Fixes of issues	1 day
Menu (Emergency)	Development	UI designing (On header layout)	½ day
		Activity creation	1 day
		DB integration	1 day
	Testing	Testing Emergency page	½ day
	Rework	Fixes of issues	½ day
Menu (Help)	Development	UI designing (On header layout)	½ day
		Static page creation	2 days
	Testing	Testing Help page	½ day
	Rework	Fixes of issues	1 day
Menu (Logout)	Development	UI designing (On header layout)	½ day
		Activity creation	½ day
	Testing	Testing Logout functionality	½ day
	Rework	Fixes of issues	½ day
Home (Notifications) page	Development	UI designing	1 day
		Activity creation	2 days
		DB integration	2 days
	Testing	Testing Homepage	½ day
	Rework	Fixes of issues	1 day

Future work

For second phase implementation, some enhanced features will be included which are described as follows:

1. It will be able to work without the internet with pre-loaded information.
2. When the user is sleeping and there is the red alert situation, an alarming message will alert the user.
3. User will be able to choose multiple locations for alerts which will send the user relevant notifications as per that selected areas.
4. User will be able to change the notification settings from anywhere if user has changed his or her home location.
5. A short-cut button for ‘Help’ which will help the user to send a message to loved ones without opening the app in case of disaster and user can be tracked easily by his or her GPS location.
6. Its ‘multilingual’ functionality will make it usable for all people with different languages.

7. This app will have some advanced features like post information about user's region to update safe zones and add up to 5 contacts.
8. In case of an earthquake, the app will automatically show the updated routes so that users can avoid damaged routes.

Challenges and issues faced during the development

During the implementation of first phase of 'Alert ME' app, some challenges were faced. These challenges are described as follows:

1. Registration activity not available in Android studio, so found difficulty to create registration page manually.
2. Navigation from login activity to registration activity using intent and how to pass parameters between intents.
3. Creation of multiple tables by extending SQLite Helper classes.
4. Passing user email from Login screen to Home screen to recognise that same user is accessing the home page.
5. Creation of drop down list for disaster registration page.
6. Display of menu on the header layout.
7. Display of notifications list dynamically on notification page as soon as it is registered.
8. Order of notifications according to latest one on the top.
9. To make static page used in 'Help' scrollable.
10. To make call from emergency page on registered and disaster helpline numbers.
11. Showing helpline number of latest disaster activity on emergency page.

Appendices

The list of progress reports during development of the project are as follows:

1. Appendix A: Progress report 1
2. Appendix B: Progress report 2
3. Appendix C: Progress report 3

Appendix A: Progress report 1

IT8x15 – Assignment Three, Project Progress Report

Project

Project Name	Notification system for civil defence emergencies in New Zealand
Student Name	Vineet Kaur
Student ID	**21701234**
Report Date	*9th Oct 2017*

Report

Project progress to date

(Describe the progress made to date)

1. *User Login page:*
    - UI designing
    - Activity construction
    - Database integration (READ)
2. User registration page:
    - UI designing
    - Activity construction
    - Database integration (INSERT, UPDATE, READ)
3. Testing Login and Registration page

Work to do

(Describe what has yet to be done and functionalities to develop, by when)

1. Disaster registration page: 15th Oct
    - UI designing
    - Activity construction
    - Database integration (INSERT, READ)
2. Notification page: 22nd Oct
    - UI designing
    - Activity construction
    - Database integration (READ)
    - Google API integration
3. Logout and Help page: 30th Oct
4. Testing: 6th Nov

Project issues and solutions

(Describe any issues and any identified solutions to issues)

Issue No.	Issues	Solution
1	Registration activity not available in Android studio, so found difficulty to create registration page manually.	I created empty linear layout and then used design tab to design the form.
2	I did not know how to navigate from login activity to registration activity using intent and also how to pass parameters between intents.	I googled it and found the solution. Referred link: http://www.vogella.com/tutorials/AndroidIntent/article.html
3	Multiple tables were not getting created by extending SQLite Helper classes.	I created common child class 'Helper.java' with methods onCreate() and onUgrade().

Appendix B: Progress report 2

IT8x15 – Assignment Three, Project Progress Report

Project

Project Name	Notification system for civil defence emergencies in New Zealand
Student Name	Vineet Kaur
Student ID	**21701234**
Report Date	*20th Oct 2017*

Report

Project progress to date
(Describe the progress made to date)

4. *User Login page:*
    - UI designing
    - Activity construction
    - Database integration (READ)
5. User registration page:
    - UI designing
    - Activity construction
    - Database integration (INSERT, UPDATE, READ)
6. Disaster registration page:
    - UI designing
    - Activity construction
    - Database integration (INSERT, UPDATE, READ)
7. Menu on home page (Profiles, Emergency, Help, Logout).
8. Logout functionality
9. Testing disaster registration page.

Work to do
(Describe what has yet to be done and functionalities to develop, by when)

1. Notification page: 22nd Oct
    - UI designing
    - Activity construction
    - Database integration (READ)
    - Google API integration
2. Help page: 30th Oct
3. Testing complete application: 6th Nov

Project issues and solutions

(Describe any issues and any identified solutions to issues)

Issue No.	Issues	Solution
1	Registration activity not available in Android studio, so found difficulty to create registration page manually.	I created empty linear layout and then used design tab to design the form.
2	I did not know how to navigate from login activity to registration activity using intent and also how to pass parameters between intents.	I googled it and found the solution. Referred link: http://www.vogella.com/tutorials/AndroidIntent/article.html
3	Multiple tables were not getting created by extending SQLite Helper classes.	I created common child class 'Helper.java' with methods onCreate() and onUgrade().
4	Passing user email from Login screen to Home screen to recognise that same user is accessing the home page.	Used intent.putExtra and intent.getStringExtra
5	To create drop down list for disaster registration page.	Used HintAdapter and Spinner for disaster registration page and used ArrayAdapter and Spinner for disaster view page.
6	How to show menu on the homepage.	Drawer activity created.

Appendix C: Progress report 3

IT8x15 – Assignment Three, Project Progress Report

Project

Project Name	Notification system for civil defence emergencies in New Zealand
Student Name	Vineet Kaur
Student ID	**21701234**
Report Date	*3rd Nov 2017*

Report

Project progress to date
(Describe the progress made to date)

10. *User Login page:*
    - UI designing
    - Activity construction
    - Database integration (READ)
11. User registration page:
    - UI designing
    - Activity construction
    - Database integration (INSERT, UPDATE, READ)
12. Disaster registration page:
    - UI designing
    - Activity construction
    - Database integration (INSERT, UPDATE, READ)
13. Menu on home page (Profiles, Emergency, Help, Logout).
14. Logout functionality
15. Testing disaster registration page.
16. Notification page:
    - UI designing
    - Activity construction
    - Database integration (READ)
    - Google API integration
17. Help page
18. Emergency page

Work to do

(Describe what has yet to be done and functionalities to develop, by when)

1. Testing complete application: 6th Nov
2. Bug fixes: 10th Nov

Project issues and solutions

(Describe any issues and any identified solutions to issues)

Issue No.	Issues	Solution
1	Registration activity not available in Android studio, so found difficulty to create registration page manually.	I created empty linear layout and then used design tab to design the form.
2	I did not know how to navigate from login activity to registration activity using intent and also how to pass parameters between intents.	I googled it and found the solution. Referred link: http://www.vogella.com/tutorials/AndroidIntent/article.html
3	Multiple tables were not getting created by extending SQLite Helper classes.	I created common child class 'Helper.java' with methods onCreate() and onUgrade().
4	Passing user email from Login screen to Home screen to recognise that same user is accessing the home page.	Used intent.putExtra and intent.getStringExtra
5	To create drop down list for disaster registration page.	Used HintAdapter and Spinner for disaster registration page and used ArrayAdapter and Spinner for disaster view page.
6	How to show menu on the homepage.	Drawer activity created.
7	How to show notifications list dynamically on notification page as soon as it is registered.	Used DB connectivity. Whenever homepage gets loaded, it makes DB query to get all the notifications.
8	How to show notifications list according to latest one on the top.	In DisasterHelper DB, I user Order by Created disasterId.
9	Static page used in 'Help' was not scrollable.	Used scrollable inbuilt activity for 'Help' page.
10	On emergency page, how to make call on registered and disaster helpline number.	Used makePhoneCall activity and used runtime permission check functionality to make a call.
11	Was having difficulty while showing helpline number of latest disaster on emergency page.	Put all disasters in a Map with counter as a key and retrieved the first disaster from the Map, then passed that Id to emergency activity and fetched and populated the emergency number corresponding to that disaster.

References

New Zealand Government. (n.d.). Ministry of civil defence and emergency management. Retrieved from http://www.civildefence.govt.nz/

Zhang, J. (2017). *Emergency notification on mobile devices: A trade-off between protection motivation, privacy concern and personalised notification.* (Master of Commerce in Information System), University of Canterbury, England.

Login and register page:
https://www.androidtutorialpoint.com/androidwithphp/login-and-registration-form-in-android/
https://www.thecrazyprogrammer.com/2016/09/android-login-register-using-restful-web-services-java-mysql.html
https://stackoverflow.com/questions/6384004/make-edittext-readonly
https://stackoverflow.com/questions/3285412/limit-text-length-of-edittext-in-android
https://stackoverflow.com/questions/19127071/change-string-array-in-strings-xml-to-arraylist

Pass data between activities:
https://developer.xamarin.com/recipes/android/fundamentals/activity/pass_data_between_activity/
https://www.mkyong.com/android/how-to-make-a-phone-call-in-android/

Navigation from login to registration
http://www.vogella.com/tutorials/AndroidIntent/article.html

Spinner for dropdown:
https://www.androidhive.info/2012/04/android-spinner-dropdown-example/
https://github.com/srodrigo/Android-Hint-Spinner

Google API:
http://www.truiton.com/2015/04/using-new-google-places-api-android/
http://www.truiton.com/2015/04/using-new-google-places-api-android/

Notification page/homepage: (Notification in latest order)
https://stackoverflow.com/questions/818677/android-order-by-in-query

Dynamic list view:
https://stackoverflow.com/questions/19555366/add-new-item-in-listview-dynamically

Table creation in SQLite:
https://stackoverflow.com/questions/25081316/table-not-getting-created-sqlite-android

How to run code on real device:
https://developer.android.com/training/basics/firstapp/running-app.html
https://stackoverflow.com/questions/42687607/application-installation-failed-in-android-studio

Display of Map:
https://stackoverflow.com/questions/41525637/android-emulator-not-showing-google-maps-on-screen
https://stackoverflow.com/questions/30559602/android-studio-google-map-still-blank-on-real-android-device-on-release-apk

Upload a text file:
https://developer.android.com/training/basics/data-storage/files.html

Help text file data:
https://hilo.hawaii.edu/emergency/uhhilo-eop-appendix-a.php