Weather Information Application

Sagar Maheshwari  
*Computer Science Department*   
*The LNM Institute of Information Technology*Jaipur, India  
19ucs199@lnmiit.ac.in

Nitish Khunteta  
*Computer Science Department*   
*The LNM Institute of Information Technology*Jaipur, India  
19ucs096@lnmiit.ac.in

Ayush Kabra  
*Computer Science Department*   
*The LNM Institute of Information Technology*Jaipur, India  
19ucs096@lnmiit.ac.in

*Abstract*—This paper describes our android application for weather information, created as a project for Systems Engineering Course of the current semester.

Keywords—API, Android OS, Android Studio, Volley-Library,

# Introduction (*Heading 1*)

Weather plays an important role in people’s lives. The goal of this paper is to find out what are the steps in developing an application, the difficulty of it and future improvements. With this occasion, we chose to develop a weather application. A weather application is a very handy one, with daily usability and can be constantly updated to fit certain needs. Many people now rely on data directly from their smartphones and the weather forecast is something indispensable to have. The most commonly used development environment is Android Studio, the all in one developing tool which ensures full control on the application development. The main challenge this project has it’s to provide the user with accurate and immediate data based on his location but maintaining an easy to use interface, without having to spend time configuring the application.

Android is a mobile operating system that’s based on Linux and was developed by Google in 2007. It was released for the public one year later in 2008.

# API

The proposed mobile application will be running on a Service Oriented Architecture (SOA) where the client will be the Android Phone on which the application will run. The services are communicating using JSON and XML messages using the API provided by the weather service. The service is cross platform, secured and reliable meaning that anybody that uses the API can access the database. The API used in our project is OpenWeatherMap API, it has free trial and provides with real-time weather information after taking the city name as input from the user.

# Android OS

The application will be running on Android OS. Android is a mobile operating system that’s based on Linux and was developed by Google in 2007. It was released for the public one year later in 2008.

# Android Studio

All the project file structure is generated by the Android Studio project. The project contains many files and folders but the important ones are presented in the Android manifest file. The manifest file contains essential information about the application to the Android system, information that the system must have in order to run any of the applications code. The manifest file contains two elements:

1. Activity (activities) - the tag representing elements that are displayed on the screen. For example, in this case, displaying weather information.

2. Service (service function) - the tag is used for information running in the background that does not need displaying information, such as the refresh service.

# Volley Library

Volley is an HTTP library that makes networking for Android apps easier and most importantly, faster. Volley is available on [GitHub](https://github.com/google/volley). Volley offers many benefits. Automatic scheduling of network requests. Multiple concurrent network connections. Transparent disk and memory response caching with standard HTTP [cache coherence](https://en.wikipedia.org/wiki/Cache_coherence). Support for request prioritization. Cancellation request API. You can cancel a single request, or you can set blocks or scopes of requests to cancel. Ease of customization, for example, for retry and backoff. Strong ordering that makes it easy to correctly populate your UI with data fetched asynchronously from the network. Debugging and tracing tools.

# Development

The application which is discussed in this paper is named Wheather. For the development of the application the platform used is Android Studio and the language used is JAVA and XML. The development is strictly made within the platform, not requiring any other environment. The first step is to download the new version of Android Studio that is 3.4 with its android SDK and android Virtual Device.

As can be seen in figure shown, the user when accesses the weather application, the application starts collecting the data necessary to transmit it to the server. The Android device getters information about the user current location through GPS (Global Positioning System), WI-FI, Cellular ID. After that it creates an HTTP URL request with run-time parameters (containing the information) for the API to send it to the data base. The service is responsible for querying the data, retrieving information, converting them into JSON format and sending it back through the same HTTP protocol. Of course, the format can’t be displayed on the phone, so the application converts it using JSON objects and displays it using the layouts created with the XML.

The application itself is made to be as simple and user friendly as possible, needing fewer “clicks” to set it up, but also offering a good amount of customizations and features.

##### Acknowledgment

We would like to thank Dr. Animesh Chaturvedi for their insight and guidance while creating this project and teaching the subject of Systems Engineering.

##### References

1. <https://developer.android.com/guide/components/fundamentals>

Accessed April,2021 -

1. <https://i1.wp.com/androidinterview.com/wp-content/uploads/2014/05/step1.png>

Accessed April,2021 –

1. <https://en.wikipedia.org/wiki/Service-oriented_architecture>

Accessed April,2021 –

1. <https://developer.android.com/guide/components/activities/activity-lifecycle.html>

Accessed April,2021 –

1. <https://en.wikipedia.org/wiki/Google_Play>

Accessed April,2021 –

1. Lectures and slides provided by Dr. Animesh Chaturvedi on Systems Engineering

<https://www.youtube.com/playlist?list=PLtvWi5o3JBnHMiGnsAJTb6xMzvbiqiT0r>

Accessed April,2021 –