EasyChair Preprint

№ 4823

Weather Finder: An Application for weather forecasting

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December 29, 2020

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***Abstract*— This study shows an unique weather forecasting app that can help people to plan their day schedule as per condition of weather. Our weather finder and forecasting system does it properly on fingertips. As we know that android is growing very fast on mobile platform. Location based service is the fastest growing one. This service actually works on the method of observing the current location and then providing the information regarding that particular location. We have described a system that is android based weather app. This app provides various alerts of weather like, heavy rainfall, fog, smoke and also the wind speed type features. This app is client-server based application that uses a separate database to store the 5-days forecasting information about the weather. The application is supported by openweathermap API. This application will help a lot to the users to analyze the weather of a particular day easily.**

Keywords: Android, Location based service, API

I. INTRODUCTION

In this paper we will describe the android development of what is we are implementing the "weather app" that will be based on Java and xml. Forecasting weather usage science and technology to predict the universe conditions of place and time. As we know, people they have tries to predict the weather from time to time in the thousands years and officially from 18 to 19th century [1]. So with this application you can find an accurate information about the weather around you and around the world as well. Weather forecasts are started by gathering information about the current situation of the atmosphere and using the weather to guess how the atmosphere condition will change. Personal input still needs to select the best predictive model to establish the prediction, which includes pattern recognition skills, telephone communication, model performance information, and model bias information. Temperature forecasts are used by state-owned companies to measure demand in the coming days [1]. Every day, with using weather forecasts people determine what they will wear or have with them on a given day. With this android software or application weather forecasts are now depends on android-based models that continues into account the many things in place.. In this project many APIs are implemented to work together and give an accurate output like maps is the basic feature of this app with the help of which you can easily find places without searching them, just put a pin where you want to get the weather. There are various application areas where the weather forecast is used regularly. The sensitivity of aviation industry is to the weather and precise weather forecasts are important in managing and controlling aviation [2]. Farmers depend upon weather forecasting planning and accuracy. Forest doors need weather, rain, and humidity forecasts to prevent and control wildfires. Electricity companies also depend on weather forecasts to determine what actually the people want. Some companies that have trading business pay for weather forecasts to increase profits or to stop and avoid big losses [2-3]. All of these examples are the motivation to conduct research in the field and area of weather information distribution on phones.

II. COMPARATIVE STUDY

The livelihood of more than 60 percent of the world's population depends on rainfall conditions, when the highest rainfall in Asia is the highest [3]. Accurate forecasts of heavy rainfall, at least the season before that, are very important in rainy regions.

In addition, the Asian summer rainfall is a key element in the global climate system, with significant telephone connections to global climate and climate. More than 100 years later, Asia's summer storm predictions are still being made using statistics, which are often remarkably successful. Normal cycle types can also capture some of the characteristics of Asian summer rainfall and can provide advanced short-term forecasts. In general, there are two methods used to predict the weather, one for protection and the other for flexibility[3-4].

Now, when we talk about the new era, depending on the development of living standards, the focus on climate change is becoming more and more important when social planning and their social activities take place. Therefore, weather APP numbers have become more popular recently than ever before. Drawing UI design and 7-day weather forecast and life indicators provided by many large companies like google. However, a different APP also has its own features, for example, based on LBS and app appearance, Weather Finder can provide a custom rain forecast based on the user's location. Although, different weather APPs may provide different services to

different users, the 7-day weather forecast could not satisfy the growing need for accuracy and customization of public users from the positive categories associated with different functions.[4]

III. PROPOSED ARCHITECTURE

Architecture is a clear representation of a set of concepts, which are part of a structure, including goals, objects and objects. It helps the viewer to analyze how the proposed system works. Our system needs to verify the location of the user before updating the current local weather. It shows the need to find where the user is, so we should use GPS technology. The Global Positioning System (GPS) is a net of orbiting satellites that send accurate information about the position they are currently in space that is further sent back to Earth. GPS receivers avail the signals and are used to accurately calculate and find location and time [5].

While developing a client-server system, communication between clients and a data server is required. Therefore, it is important to choose the right service and technology while improving customer performance.

1) **Data Exchange Protocols:** To establish communication between client and server in a mobile application, it is important to find the best and accurate way to exchange information between server and client to decrease mobile device restriction such as response time, traffic, and usage of resource [5-6].

2) **Mobile Positioning Technologies**: Services that are based on location are called mobile services where user location information is used to give a service. Information of location contains any(latitude, longitude, and altitude) placement. Examples would be Cell-identity, Global positioning , and techniques of WI-FI.

Architectural Flow:

Here, we describe the flow of construction data, for our system. The Android device downloads the user's current input using different technologies of positioning such as GPS, WiFi Positioning System, and Cell Positioning System.(Figure: 1)

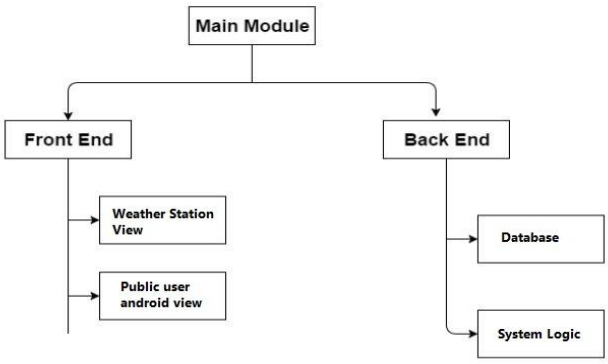

Figure-1

IV. FLOW OF ARCHITECTURE

Here, we explain the flow of the data for architecture, Android device find and takes the input such as current location using different types of positioning system technologies such as Global Positioning System, WiFi Positioning System, and Cell-identity Positioning System. (Figure : 2)

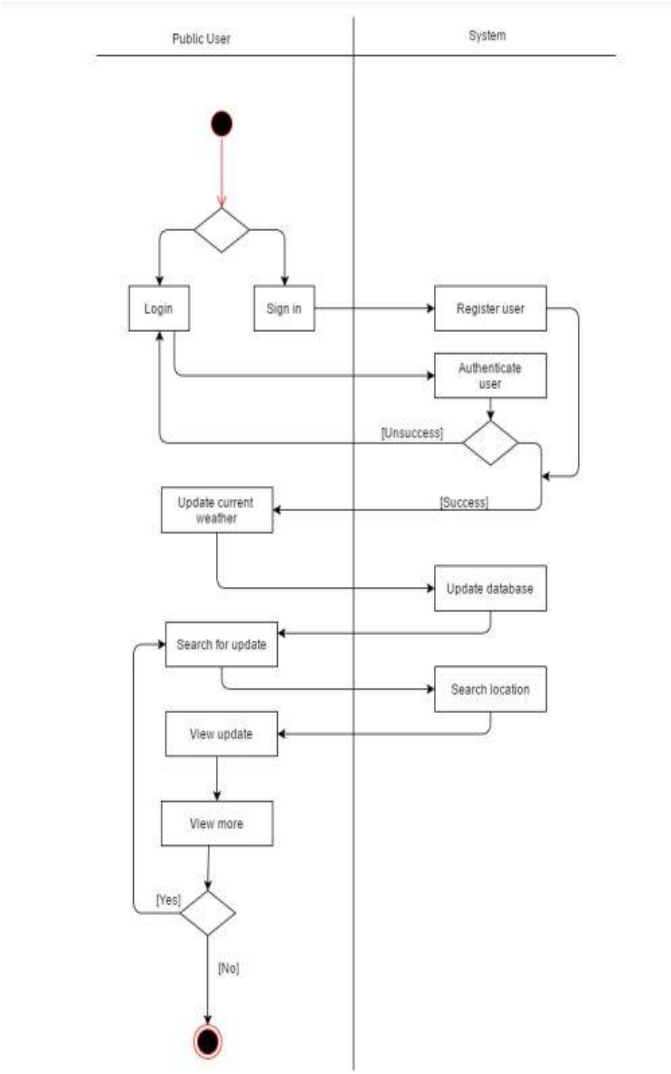

Figure-2

V. FEATURES OF THE APPLICATION

A) High quality of data:

One of the main advantages of a weather person's climate is the fact that the data collected by the app is of high quality and can be used to obtain various weather features reliably [7].

B) Reliable weather forecasts:

Weather forecasting is one of the most important aspects of climate change. With the use of technology, experts have been able to accurately predict the weather and sometimes even estimate the exact amount of rain or sleet [7].

C) More accurate results**:**

A weather app is used to determine the weather and even predict the weather results for the most accurate results. The app can easily estimate the exact weather and use this to get the predictions expected by the API of system .

D) Wind speed and direction:

Weather application can also be used too finding the speed of wind as well as the direction that it flows to. This information looks a pretty much smart.

E) Can calculate the speed of precipitation:

In addition to obtaining speed and direction, the weather app can be used to calculate the speed of rain, which was previously impossible using standard methods.

F) Weather surveillance**:**

The weather app helps to show the weather of a given area gives people the confidence of the weather and also advises the expected weather over time [8].

There are so many features that benefit users of this app that can easily predict the weather around the user so that the user can plan his day according to his need and desire. So, this app works in bulk at its end [8].

VI. APPLICATION MODULES AND IMPLEMENTATION

The implementation part describes the way that how we are going to implement our proposed solution. Hence, in this our main attention is for the code approaches and various techniques and also the progress of the system that we had implemented. After summation of all the information, we decided and approached to develop these modules. Which are:

- Weather Man Administrator Interface
- Weather Man User Interface

Module Description:

A modularization consists of well-defined manageable units with well-defined interfaces among the units. Desirable property of modular system include [8] :

a) Single, well – defined purpose of each module.
b) Modules can be separately compiled and stored in a library.
c) Modules can use another module.
d) Modules should be easier to use than to build.

Module-1

Module1 is about the interface of the application. This module explains how the system provided all the details to update it and all the details should be processed with the most efficient API system. (Appendix : Figure-3)

This module is a basic part of our app where the map acquisition feature is created and the download and processing component can be customized based on user information and how much and where the user wants to search. After gathering all the requirements and details necessary for development, we can design and improve the system by meeting all the needs of all users. (Appendix : Figure-4)

Module-2

Module 2 is about the visual user interface of the interface. By default, when the app is opened the user will be asked to turn on GPS. Therefore, that data will be displayed according to the user's first location. If users want to know about the weather of any other place, they can search for a location. The application provides all the information about the weather for that particular area such as is there any possibility of rain or not, how is the wind speed, what is the temperature and more. This will greatly help the user not to miss any of the work he will be doing because of the weather around him. The user will get an accurate view of the weather so that everything is easier and much better if you are afraid of the next weather [10-11]. This user module has in-depth weather analysis and wind speed and direction in which the wind will blow. This app helps the user to look better and look for the weather and much more by finishing well. (Appendix : Figure-5)

Downloading and processing is always done simultaneously when the user updates the window so that the data is constantly updated.

IMPLEMENTATION PROCESS

1) At first, we created an opening window in which we have added our buttons, arrows and much more in the activity module. That also includes border and the area part where our activity will take place. (Appendix : Figure-3)

2) In the next window we have implemented the search bar with which we will search any location. By the way in this application we have also implemented the GPS system which will automatically ask the user to enable it. So it will give the result of that specific location. This process can be seen in the image right below. (Appendix : Figure-4)

3) In the next window we will implement the window which will show the result of the search so it will provide the weather of 5-6 days of analysis. A we can see in the image below that it is showing the weather update for the hours ahead. Means our API is fetching data correctly. (Appendix : Figure-5)

4) In the next window we have designed the background to create a classic look that will change according to the weather means for sunny day there is a background set with a sun and hills. And for other weather like rain, autumn etc. there are different backgrounds. (Appendix : Figure-6)

5) At last, we created a about window that has the specific information about the app and its developers that can be drawn by simply clicking on the about info. bar through side section. (Appendix : Figure-7)

So, the window images that are implemented in the android studio, in which we have created various activity that work differently for the specified purpose. In images there are activities that are main, search activity etc. also there are modules for this application above the implementation part.

VII. CONCLUSION

We presented the details of the construction and implementation of a location-based weather finder application. Our application provides current weather conditions and a forecast for five days with heavy rain, fog, smoke, wind speed etc. As a result, policymakers, planners, decision makers and other stakeholders are increasingly [12] seeking information on the nature of the worst events on time scales from days to days, seasons and decades. With this system the weather report makes it easier. Less chances of malfunction exist. The plan has reached a stable stage but further progress is yet to be made. The system operates at a high level of efficiency that means the results fetched by the user through this system are accurate and almost precise. This is where art and imagination are used. Analysts need to think of new ways to generate new ideas [13].

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APPENDIX

A) Main window of the weather finder application.(Figure.3)

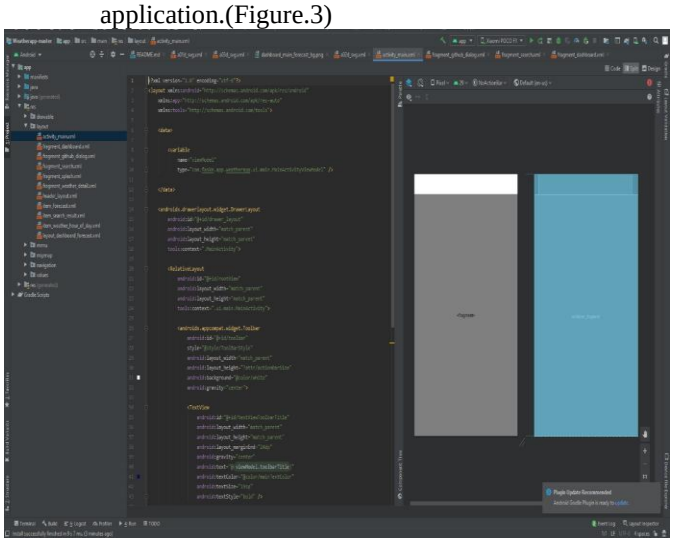

Figure-3

B) Search activity window of the application where the GPS is enabled automatically. (Figure-4)

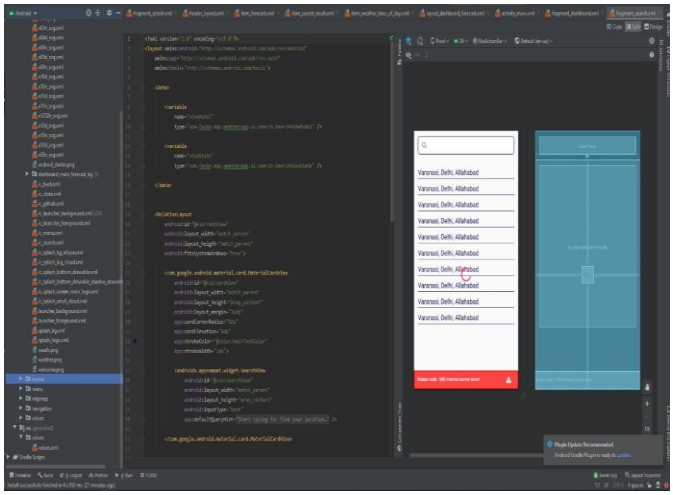

Figure-4

C) Weather information screen of the application (figure -5)

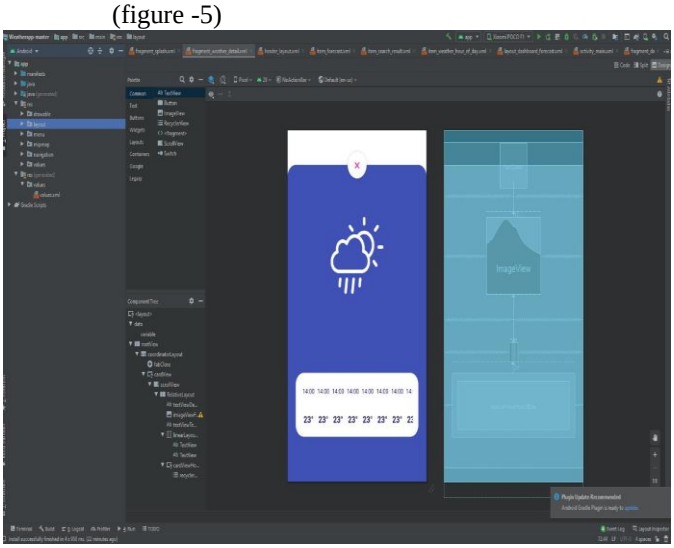

Figure-5

D) Weather background according to the weather around the user.(Figure-6)

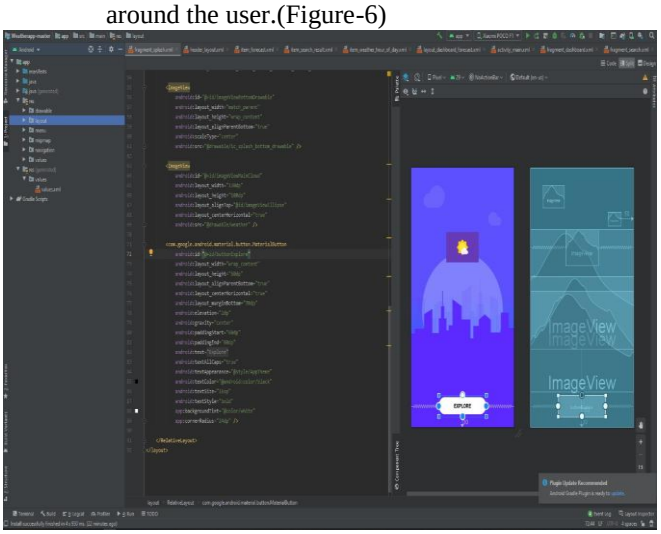

Figure -6

E) Window having information About the application weather finder.

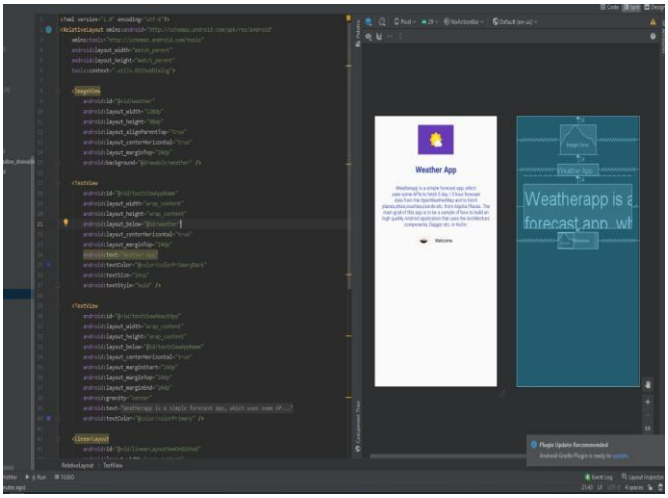

Figure-7