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## Application: Anwaa

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## **Abstract**

This report provides a comprehensive overview of the "Anwaa" weather application, a free application provided by the General Authority of Meteorology and Environmental Protection in Saudi Arabia. The application aims to provide accurate and real-time weather information, including accurate forecasts, early warnings of severe weather conditions, interactive maps, and customization options. This report is designed to analyze the application's features, compare it to other weather applications, and evaluate its design and functionality. Overall, the "Anwaa" application is a valuable tool for citizens and residents of Saudi Arabia, as it provides them with reliable weather information that helps them make informed decisions and protect themselves and their property.

# **1 CHAPTER INTRODUCTION**

## **1.1 Introduction:**

Weather applications have become an essential part of our daily lives, helping us plan various activities and protect ourselves from sudden weather changes. With the growing reliance on climate data in fields such as agriculture, transportation, and even tourism, there is a need for applications that can provide right forecasts and reliable weather information.

In Saudi Arabia, where the weather is characterized by harsh conditions and significant variability, knowing the weather is crucial. This is where the “Anwaa” application, offered by the General Authority of Meteorology and Environmental Protection, comes into play. It serves as an effective tool that provides high-quality weather services aimed at protecting lives, supporting economic activities, and helping people make informed daily decisions.

“Anwaa” stands out with several features that make it the ideal choice for staying updated on weather conditions, including accurate forecasts, instant alerts for severe weather, and interactive maps that allow users to easily check weather conditions across different regions in the Kingdom. The application's simple and user-friendly interface enables quick access to the required information, with the option to customize notifications based on each user's preferences.

A recent survey involving 10 application users revealed that “Anwaa” has succeeded in establishing itself as a reliable and easy-to-use tool for managing weather-related tasks. Participants highlighted the high accuracy of the forecasts, especially about rainfall, and appreciated the application's ease of use and customization flexibility. Despite the positive feedback, some users suggested adding more detailed forecasts and expanding notification customization options.

“Anwaa” proves to be one of the leading weather applications in Saudi Arabia, combining accuracy and ease of use to become a daily companion for many individuals. With continuous improvement opportunities, the application is well-positioned to meet users' expectations and enhance their experience further.

## **1.2 The purpose of Anwaa**

Providing accurate weather forecasts, the application provides detailed information about the current and expected weather conditions, including temperature, humidity, chances of rainfall, wind speed, and other weather-related data.

Sending early warnings, the application sends instant notifications to users when there are bad weather conditions, such as thunderstorms, heavy rain, and strong winds, helping them take the necessary precautions.

Facilitating access to weather information, the application makes obtaining weather information easy and fast, as users can access this information anytime and from anywhere using their phones.

## **1.3 Existing Programs**

There are many weather applications available on the market, including popular options like AccuWeather, WeatherPro, Yahoo Weather, The Weather Channel, and Google Weather. Here's a table explaining the important differences between them and why Anwaa is the better choice.

Applications	Advantages	Disadvantages
AccuWeather	Provides detailed hourly weather information, early warnings of weather events, and interactive maps	It contains a lot of annoying ads in the free version. To avoid these ads, you must subscribe to the paid version of the application.
WeatherPro	Provides accurate long-term forecasts, interactive radar, and advanced features such as air quality index	Some features may only be available in the paid version
Yahoo Weather	Known for its beautiful interface and unique design, it provides basic weather information	Features may be limited compared to other apps
Google Weather	Integrated with Google Assistant, it provides quick information about the current weather	Doesn't offer many advanced features
The Weather Channel	Provides comprehensive weather information, including videos and weather news	The application may be a bit heavy on devices with modest specifications

Table 1: Comparison Table

## 1.4 Comparison of Anwaa with Existing Programs:

For Anwaa, it is considered ideal in terms of long-term forecasts, as it features many accurate details about the current and expected weather conditions in different regions of the Kingdom, including temperature, rainfall, and others. The application also protects lives and property by sending instant alerts when severe weather conditions such as thunderstorms and heavy rain occur. The application helps individuals plan their days better, whether it is choosing the right clothes or planning trips. Anwaa also contributes to raising awareness of the importance of monitoring weather conditions and taking the necessary precautions. The Anwaa application also provides accurate information about the weather conditions in the holy places, which helps pilgrims and Umrah performers plan their visit. Anwaa is also characterized by being completely free and integrated with Saudi government services, and it includes all cities in the Kingdom of Saudi Arabia with the possibility of adding many other cities. Simply put, the Anwaa application has made obtaining accurate information about the weather and climate easy and fast, which has contributed to improving the quality of life for citizens and residents in the Kingdom of Saudi Arabia.

## 1.5 Conclusion

Chapter 1 provides a comprehensive introduction to the Anwaa weather application, explains its importance and features, compares it to other weather applications, and reviews users' opinions about the application.

## **2 CHAPTER ANALYSIS**

## **2.1 Introduction:**

At this chapter contains a detailed summary of the functional and non-functional requirements for the "Anwaa" application.

## **2.2 Functional Requirements:**

- The application provides detailed information about the current and forecasted weather conditions, including temperature, hourly weather forecast, humidity, wind speed, and chance ,dew point,pressure,visibility and UV index.
- The application provides detailed information about the current and forecasted weather conditions, including temperature, hourly weather forecast, and Map of Mashaer locations and prayer timing for Mashaer sites.
- The application displays animated images of weather radars that show the movement of clouds, precipitation, and wind.
- The application sends notifications to warn users of thunderstorms, hurricanes, and other severe weather events.
- The application allows users to customize the notifications they receive, such as the type of alerts they want to be notified about.
- The application provides a tool that enables users to share pictures of the weather conditions.
- The application provides a tool to determine the user's location automatically or through the search tool.
- The application also allows users to add and edit multiple locations to follow the weather and conditions in them.
- The application provides a daily report on the weather conditions in your city and allows you to share this report.

## **2.3 Non-Functional Requirements:**

- Performance: The application should respond quickly to user actions.
- Scalability: The application should be able to handle a large number of users concurrently without performance degradation.
- Availability: The application should be available to users 24/7.
- Usability: The application should be user-friendly and easy to navigate.
- Dependability: The application should function consistently and reliably.
- Compatibility: The application works well on a variety of devices and operating systems.
- Accessibility: The application is available in multiple languages (English, Arabic).

## **2.4 Conclusion**

Chapter 2 provides a detailed analysis of the functional and non-functional requirements for the Anwaa weather application. The chapter outlines the specific features and functionalities that the application must provide to meet the needs of its users.

### **3 CHAPTER DESIGN**

### **3.1 Introduction:**

At this chapter, the interfaces will be presented with a detailed explanation of them mentioning the programming languages used and the database.

### **3.2 Programming language and database:**

Backend Development, Anwaa use Java for the backend. Java is a sturdy and versatile programming language that is frequently used in enterprise applications. Java's strong community support, security features, and scalability make it an excellent choice for managing the intricate requirements of government systems.

Database Administration

Relational databases like MySQL, PostgreSQL, or Oracle are frequently used to store and handle the enormous amount of data created by Anwaa. These databases ensure that information is easily available and well-organized by providing effective means of storing, retrieving, and querying data.

### **3.3 DataBase:**

Weather Database for Anwaa This table aims to provide a simplified model for structuring weather-related data and forecasts. It includes a set of essential fields such as location, temperature, and wind speed, which help in organizing the information and making it easier to access within the “Anwaa” application.

Field Name	Description
WID	Unique identifier for each weather report
Location	The location (city or region)
Tempe	Temperature (in degrees Celsius)
Humid	Humidity percentage (%)
WS	Wind speed (km/h)
WD	Wind direction (e.g., North, South, East, West)
WC	Weather condition (Sunny, Cloudy, Rainy, etc.)
Precipitation	Precipitation level (mm)
Visibil	Visibility level (kilometers)

Table 2: Weather Data Table

WID	Location	Temp	Humid	WS	WD	WC	Precipitation	Visibil
1	Riyadh	35°C	20%	15 km/h	North	Sunny	0 mm	10 km
2	Jeddah	30°C	65%	20 km/h	South	Cloudy	2 mm	8 km
3	Dammam	28°C	80%	10 km/h	East	Rainy	10 mm	5 km
4	Mecca	33°C	55%	25 km/h	West	Windy	0 mm	6 km
5	Medina	36°C	30%	18 km/h	Northeast	Sunny	0 mm	12 km

Table 3: WeatherReports Table

## **3.4 Interfaces**

### **3.4.1 Main Interface:**

The main interface displays current weather information for your location and hourly forecasts for today and the coming days. It also displays temperature and a summary of today's temperature. It also provides other information for the current hour, such as humidity, chances of rain, visibility, UV radiation, wind speed, and direction. It displays more customized options, such as adding favorite locations. Search interface allows the user to search for cities and get weather information for them. It displays a daily weather report.

### **3.4.2 Settings Interface:**

The settings interface allows you to enable and disable notifications and also gives users the option to enable notifications with the choice of the alarm you want to activate the notification for. It displays temperature settings and allows users to choose any type of temperature they want (Celsius, Fahrenheit, Kelvin). It also allows users to change the language (Arabic and English) and change the application mode from night to day or automatic. It also displays the terms of use and privacy policy so that users can view them. The About Us interface displays information about Anwaa and its launch and an explanation of the services it provides.

### **3.4.3 Mashaer Interface:**

The mashaer interface displays the temperature and weather conditions in the holy sites (Makkah, Madinah, Arafat, Mina, and Muzdalifah) and also displays hourly weather forecasts and weather forecasts for the coming days. The map also displays weather forecasts and temperatures for the places from which the pilgrim or Umrah may enter ihram. It displays prayer times and expected temperatures for users.

### **3.4.4 Maps Interface:**

The maps interface displays interactive maps showing the current weather conditions and future forecasts for the regions of the Kingdom of Saudi Arabia, where there are many weather layers (precipitation map, cloud map, temperature map, wind, UV index, humidity map, weather stations, radar map, and metar map). Here is an example of a temperature map and wind.

### **3.4.5 Early Warning Interface:**

The early warning interface displays a map of the Kingdom of Saudi Arabia with a warning mode for each region. This is done by setting a specific color that indicates the warning within the region. A light green warning indicates that there are no areas affected by weather phenomena. A yellow warning means that a region may be affected by weather phenomena. An orange warning indicates that a region is affected by weather phenomena and caution must be taken. As for the red warning, it indicates that the region is affected by severe weather phenomena or floods. All caution must be taken, and adherence to the instructions of the Civil Defense must be adhered to. Users can choose the type of warning they want to receive notifications for by activating the toggle icons

for the types of warnings they want to receive. This list allows you to choose the areas you want to receive warnings for. It includes several areas, including administrative areas such as governorat or cities. And geographical areas, such as coasts or mountains.



Figure 1: Main interface of Anwaa

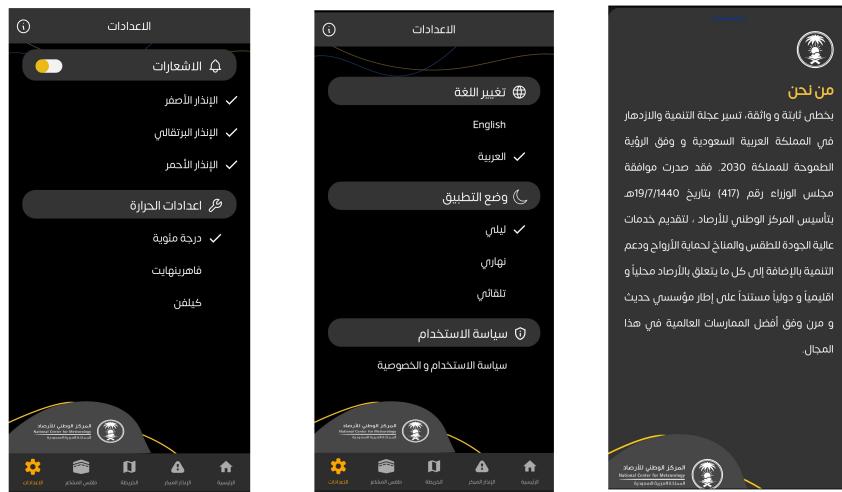


Figure 2: Settings interface of Anwaa

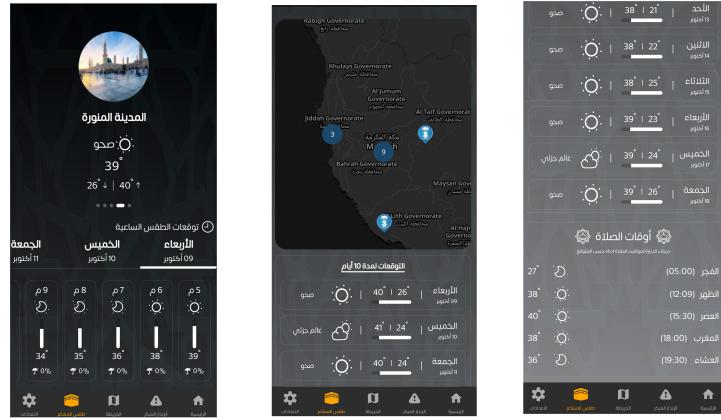


Figure 3: Mashaer interface of Anwaa



Figure 4: Map interface of Anwaa

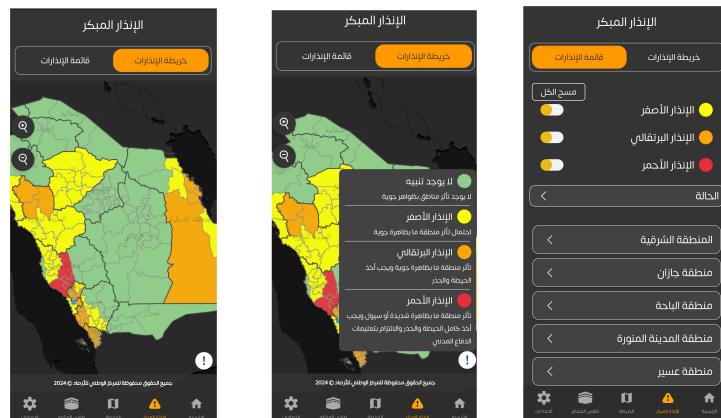


Figure 5: Early Warning interface of Anwaa

### 3.5 Conclusion

In this chapter, we have presented the programming languages and databases used in Anwaa. Anwaa employs a robust technology stack to provide accurate weather information, utilizing popular JavaScript frameworks for a user-friendly front-end experience. The back-end is powered by secure Java, while relational databases like MySQL, PostgreSQL, or Oracle ensure efficient data storage.

We have also provided a detailed overview of the Anwaa application interfaces, which are designed to cater to the weather needs of users. With an intuitive design and easy-to-use user interface, the application offers all the necessary information for making informed daily decisions. Whether you are planning a trip or seeking weather conditions in holy places, Anwaa is your ideal companion. We are continuously striving to enhance your experience and look forward to introducing more features and improvements in the future.

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