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Introduction

**Purpose**:

The purpose of the product is to assist in predicting weather conditions of a given area thereby helping in averting timely accidents, assist in adoption of better preventive measures for handling disasters and assist in various other fields where assessment and analysis of weather plays an important role.

**Intended Audience**:

**Users**: This document delves in a very precise manner into the various aspects of this weather forecasting software. The language is simple enough for users to familiarize themselves with the various functionalities of this product.

**Marketing staff**: they can gain an insight into the various functionalities of the product and market it accordingly.

**Developers:** Developers are provided a detailed insight into the various functionalities of the product and they can utilize the same to make future enhancements to the product.

The rest of the product contains a detailed overview about the functions of the product, the intended users etc.

**Product Scope**

The software that is being developed is a weather forecasting system. The purpose of this system would be to predict the weather, given a particular area. The predictions are not only confined to the present but also to the past and the near future

Key Objectives and Goals:

1. **Accurate weather predictions**: Make accurate and real time analysis of current weather conditions.
2. **User Friendly Interface**: Users will be able to make use of the software very easily with minimum difficulty. They can easily access the software on their mobile devices as well as laptops
3. **Timely Updates**: Weather information should be updated in real-time or at frequent intervals to reflect the current weather conditions and any changes that may occur.
4. **Customized alerts**: Users should be warned of severe weather conditions if there are any. This would prevent accidents.

Alignment with corporate goals:

1. **Enhancing User Experience**: By offering accurate and reliable weather predictions, the software can improve user satisfaction and engagement. This, in turn, can drive increased user retention and loyalty.
2. **Supporting Decision-Making**: Providing detailed weather forecasts can aid individuals and businesses in making better decisions, such as planning outdoor events, optimizing travel routes, or managing agricultural operations. This can contribute to overall efficiency and effectiveness.
3. **Competitive Advantage**: A high-quality weather forecasting system can differentiate a business in sectors like travel, agriculture, logistics, and outdoor event planning. It can attract and retain users, thereby improving market position and competitiveness.
4. **Data Monetization**: Weather data can have commercial value. Businesses can explore opportunities to monetize weather data by offering premium services or data insights to industries that rely on accurate weather information.

**References:**

**Overall Description**

**Product Perspective**

This product is a follow-on product of the software that government agencies such as The Indian Meteorological Department, National Centers for environmental prediction, NASA make use of.

**Product Functions**

1. Predict the weather conditions of a particular area. Provide information to users in terms of temperature, humidity etc.
2. Provide alerts to users in case of severe weather conditions

**User characteristics**

The various user classes that will use this product are:

1. **General Public Users**:

Characteristics: These users are the general public who access weather forecasts for daily planning and information.

Requirements: They require user-friendly interfaces, easy-to-understand weather information, and location-based forecasts. Timely and accurate updates are essential.

1. **Outdoor Event Planners**:

Characteristics: Event planners, organizers, and individuals planning outdoor activities and events.

Requirements: Detailed weather forecasts, including precipitation, wind speed, and UV index, are vital. They may need long-range forecasts to plan events well in advance.

1. **Travelers**:

Characteristics: Tourists, business travelers, and commuters who need weather forecasts for travel planning.

Requirements: Access to real-time weather information, airport-specific forecasts, and travel safety alerts for potential disruptions.

1. **Farmers and Agriculturists**:

Characteristics: Agriculture professionals and farmers who rely on weather data for crop management.

Requirements: Specialized agricultural weather forecasts, including soil moisture, frost predictions, and planting and harvesting recommendations.

1. **Emergency Services**:

Characteristics: First responders, emergency management teams, and public safety agencies.

Requirements: Timely severe weather alerts, flood predictions, and disaster preparedness information.

1. **Media and News Outlets**:

Characteristics: Media professionals and news agencies providing weather reports to the public.

Requirements: Reliable and up-to-date weather information, visualization tools, and graphics for broadcasting.

1. **Educational and Research Institutions**:

Characteristics: Schools, colleges, and universities using weather data for educational purposes.

Requirements: Access to educational resources, weather data APIs, and student-friendly interfaces.

**Operating Environment**

Can be operated on any operating system on a laptop. Can be operated on android systems in mobile phones.

**Design and Implementation Constraints**

1. **Data Sources and Quality**:

**Limitation**: The availability and quality of weather data from various sources can be a limitation. Inaccurate or incomplete data can impact the accuracy of forecasts.

1. **Computational Resources:**

**Limitation**: Machine learning models for weather forecasting often require significant computational resources, including powerful hardware and cloud infrastructure.

1. **Model Development and Validation:**

**Limitation**: Developing and fine-tuning machine learning models for weather forecasting can be time-consuming and challenging.

1. **Interoperability:**

**Limitation**: The system may need to interface with various applications, platforms, and devices, requiring interoperability considerations.

1. **Scalability and Performance:**

**Limitation**: Ensuring the system's performance under increased load and scaling can be challenging.

**Assumptions**

One of the most important assumptions that is made while creating this software is that data related to weather conditions for a particular area is available and ready at hand. This plays an important role as the availability of data can make or break the creation of the project.

The second assumption is that the application/product if developed can be easily integrated in any operating environment. As newer versions of operating systems are being released, in the worst-case scenario the application might not be supported in one of these versions.

**Appendix A: Glossary**

**Appendix B: Field Layouts**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Field** | **Length** | **Datatype** | **Description** | **Is mandatory** |
| Account Number | 16 | Numeric |  | Y |
| ISFC Code | 11 | Alphanumeric |  | Y |
| Card Amount | 20 | Numeric |  | Y |
| Mandate Start Date | 8 | Date | Date of mandate Registration | N |
| Mandate End Date | 8 | Date | Date of mandate Expiry | N |
| Status | 25 | Alphanumeric | Status of Registration | Y |
| Customer Name | 60 | String |  | Y |
| Reject Reason Code | 4 | String | Reject Reason code if mandate is | N |
|  |  |  | rejected |  |
|  |  |  |  |  |

**Registration Report Transaction Report**

Bank Account Number Transaction Reference Number

ISFC Code Bank Account Number

Bank Name IFSC Code

Account Status Bank Name

Account Type Customer Name

Customer Name Card Number

Card Number Debit Transaction Amount

SI Start Date Transaction Date

Status Status

Remarks Debit Attempt Number

Remarks

**Appendix C: Requirement Traceability Matrix**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S no** | **Requirement**  **ID** | **Brief Description**  **of Requirement** | **Architecture**  **Reference** | **Design**  **Reference** | **Code File**  **Reference** | **Test**  **Case ID** | **System**  **Test**  **Case ID** |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |