

Universidad Politécnica de Aguascalientes

Computer Systems Engineering

Course: Mobile programming

Integrator Project Progress

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Product name

CLOUDY.

The application is called CLOUDY because it focuses on rainfall prediction by analyzing images of the sky. This name reflects its purpose: to analyze clouds and provide detailed weather information based on cloud classification, in addition to other atmospheric factors such as pressure, humidity and temperature. CLOUDY uses this information to provide more accurate forecasts, making it a useful tool for both casual users and specific sectors that need reliable weather data, such as agriculture or outdoor events.

Description

CLOUDY is a mobile application that allows users to predict rainfall with a physical device that by analyzing photographs of the sky, complemented with atmospheric pressure, humidity and temperature information is able to predict the weather for that day. This approach allows to offer more accurate forecasts than traditional weather applications by focusing on cloud classification. Thus, CLOUDY becomes a unique and useful tool for casual users and specific sectors that depend on accurate weather information, such as the agricultural sector or outdoor events.

Scalability of CLOUDY as a SaaS Solution

CLOUDY is designed as a scalable SaaS service with a subscription-based, multi-tenant architecture. This setup allows individual users and single-person businesses to share the same secure infrastructure while keeping their data separate, offering flexible climate monitoring options tailored for a single location.

With the purchase of the device, you gain access to the complete CLOUDY app with a premium subscription for a year. After that time, you must choose a monthly or annual subscription plan:

- **Free Subscription:** Without the premium plan, two ads appear when opening the app and an additional ad before viewing the reading results. This plan allows you to predict the weather and forecast rainfall based on temperature, humidity, atmospheric pressure readings and a photograph taken every hour.

It generates an hourly forecast and predictions for the next few days, including a photograph of the sky based on the data.

- **Premium Subscription:** Includes all the features of the Basic Plan but without ads, designed for users who prefer an uninterrupted experience or require an ad-free interface due to the importance of their work.

Please note that, initially, the app will not have integrated in-app payments; instead, subscription invoices will be sent via email for payment processing.

Competitive Analysis

In the weather forecasting market, competitors such as ClimaCell, WeatherBug and Weather Google all have strengths and weaknesses that highlight CLOUDY's advantages.

ClimaCell:

- **Strengths:** ClimaCell specializes in high-accuracy forecasts using IoT data and advanced dashboards, making it a powerful option for enterprises.
- **Weaknesses:** However, this sophistication and its high cost make it less accessible to the common user.

WeatherBug:

- **Strengths:** WeatherBug offers a simple and accessible application for general forecasting.
- **Weaknesses:** Lacks the image analysis and cloud classification capabilities offered by CLOUDY.

Google Weather:

- **Strengths:** This app offers the option to select the time of day to search for the weather forecast for the selected time. It allows access to weather information quickly and easily through a search. It is only necessary to type “weather” followed by the location to obtain updated and relevant predictions.
- **Weaknesses:** Its interface can be unintuitive for the user as there is no reference to each aspect, as well as unpleasant to the eye. Although it

provides general weather information, it lacks in-depth analysis and real-time pictures.

CLOUDY:

- **Advantages:** CLOUDY is positioned as an advanced yet affordable solution that provides customized predictions without requiring advanced technical knowledge. It offers detailed image analysis and accurate cloud classification, overcoming the limitations of its competitors.

Advantages and disadvantages

CLOUDY stands out for its accuracy, scalability and ease of access from an intuitive mobile application. Its combination of visual and atmospheric data allows for more reliable predictions, which sets it apart from traditional weather apps. However, it depends on the availability of clear sky imagery, which can be a limitation in low visibility conditions. In addition, image processing and cloud infrastructure can represent considerable costs, affecting the price of your subscriptions.

Advantages of CLOUDY:

- **Real-time accuracy:** uses real-time imagery to detect weather in the area, providing more accurate data.
- **Competitive comparison:** Unlike other applications that only provide estimates and may be inaccurate, CLOUDY constantly updates information.
- **Combined visual and atmospheric data:** This combination allows for more reliable forecasts.
- **Ease of access:** The mobile application is intuitive and easy to use.
- **Scalability:** It can be adapted to the needs of different users, from individuals to small companies.

Disadvantages of CLOUDY:

- **Dependence on the availability of clear images:** In low visibility conditions, accuracy may suffer.
- **Considerable costs:** Image processing and cloud infrastructure can represent considerable costs, which can affect the price of your subscriptions.

- **Geographic limitation:** Currently intended for users within Aguascalientes.
- **Lack of live simulations:** Cannot generate “live” simulations of wind or weather conditions, as these are simulations that often do not reflect real conditions.

Market Strategy and Monetization

CLOUDY targets individual users and small businesses needing accurate, affordable weather forecasts. Key customer segments include motorcyclists and farmers heavily impacted by sudden rainfall. For motorcyclists, accurate forecasts determine whether they need rain gear; for farmers, forecasts guide irrigation decisions, helping them know when to wait for rain or hire irrigation.

The device itself is priced at \$119 (taking into consideration the price of the raspberry, the camera and the necessary sensors), which includes a one-year premium subscription. After the first year, customers can choose between a monthly subscription of \$5 or an annual plan for \$50, offering a slight discount for yearly subscribers.

For the CLOUDY app, these are the subscription tiers planned:

- **Free Subscription:** This subscription allows you to continue storing data on temperature, atmospheric pressure, humidity and a photograph of the sky, but when you open the application, 2 ads will open and if you want to change section or at the end of a prediction, an ad will pop up. We will implement the Cost Per Thousand (CPM) model in our app, first we register the application in an ad platform, such as Google AdMob, and integrate a code (SDK) that loads ads in the app. These ads are shown at the times we set, and for every 1,000 times users see the ads, we receive a payment, which is usually between \$2 and \$10 USD, depending on the type of users and region. For example, with 1,500,000 impressions per month and a CPM of \$5, we could generate \$7,500 USD per month without users having to interact with the ad.

- **Premium subscription** (\$5/month or \$50/year): It removes all the ads and keeps all the functions and predictions of the previous one, it is designed for people who want to support the company and people who don't want to wait for the ads to end or don't want ads at all.

Please note that, initially, the app will not have integrated in-app payments; instead, subscription invoices will be sent via email for payment processing.