

Designing SkyMate: A Smart Weather System for Personalized Lifestyle

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Abstract—

Weather apps are good at showing numbers — temperature, humidity, and chance of rain — but they leave users to decide what those numbers mean. Should I carry an umbrella? Is the air suitable for a morning run? Is today a good day to travel? This paper presents SkyMate, an AI-powered mobile weather assistant that combines real-time weather data, air quality, and location services with an AI recommendation layer to provide plain-language guidance on clothing, hydration, food, travel, and health precautions. Its Sky Moments feature also highlights photography-worthy skies and astronomical events.

The design is based on survey responses from 80 participants. Although 80% used Google Weather most often, they rated their current app only 3.60 out of 5. Rain prediction (76.3%) and temperature (63.8%) were the most-checked details, while 78.8% wanted an AI assistant that explains weather simply. Simple explanations (63.8%) were the most-wanted AI feature, followed by personalized alerts (45.0%). Technically, SkyMate uses React Native, Expo, Node.js, Express.js, MongoDB Atlas, Firebase Cloud Messaging, and Google Maps. Future work includes regional-language support, farming advisories, and wearable integration, aiming to help users act on forecasts rather than simply read them.

Keywords: Weather Forecasting, Artificial Intelligence, Personalized Recommendation, Air Quality Index, Weather Alerts, Sky Photography, Astronomical Events, React Native, Node.js, MongoDB, Mobile Computing

I. Introduction

Checking the weather is one of the most routine things people do on a phone. Whether it is deciding what to wear, when to leave for work, or whether a trip is worth making, the forecast quietly shapes the

day. Behind that simple screen sits decades of progress: numerical weather prediction has delivered steady gains in forecast skill [1], newer machine-learning models now match or beat conventional medium-range systems on many measures [2], and generative models are improving short-term rain nowcasting [3].

Better forecasts, however, do not automatically become better decisions. Most weather apps still present a grid of numbers — temperature, humidity, pressure, wind speed, rain probability — and leave the interpretation to the user.

A reading of 38 °C with high humidity, or an air quality index of 180, means little to someone who just wants to know whether it is safe to jog, what to wear, or how much water to drink. The same gap appears with warnings. The World Meteorological Organization's Early Warnings for All initiative treats communicating warnings and preparing people to act on them as core parts of protecting lives, not add-ons to forecasting [4]. Air quality follows the same pattern: health guidelines exist [5], but a bare index value rarely tells a user what to do about it.

This research's own survey points the same way. Of the 80 people who responded, 52.5% check the weather daily or several times a week, and 80.0% rely on Google Weather — yet they rated their current app only 3.60 out of 5 on average, and 41.3% gave it three stars or fewer. When asked whether they would like an AI assistant that explains the weather in simple language, 78.8% said yes and another 13.8% said maybe; only 7.5% said no.

The survey also showed what people look at and what they want next. Rain prediction (76.3%) and temperature (63.8%) were the most-checked details, followed by weather alerts (41.3%) and air quality (27.5%). Among AI features, simple weather

explanation led (63.8%), with personalized alerts (45.0%), travel suggestions (41.3%), health recommendations (41.3%), and farming advice (40.0%) following close behind. In free-text comments, respondents repeatedly asked for accurate, real-time, location-specific forecasts and timely alerts. These findings shaped SkyMate's feature set and priorities directly.

SkyMate responds by combining real-time weather data, air quality monitoring, GPS-based location, and an AI recommendation layer in one mobile application. Instead of only displaying data, it explains conditions in plain language and turns them into suggestions on clothing, food, hydration, outdoor activity, sleep, travel, and health precautions. It also adds Sky Moments, a feature that links weather with sunrise and sunset timings, visibility, and astronomical events to point users to interesting sky-viewing and photography opportunities. A few requested features — regional-language support, farming advice, and longer-range outlooks — are earmarked for later versions rather than this one. Combining the existing research with the survey data, this study aims for a weather app that closes the gap between weather information and everyday decision-making.

II. Related Work and Literature Review

Weather forecasting itself is a mature and fast-moving field. Numerical weather prediction, which solves the physical equations of the atmosphere on powerful computers, has improved steadily over the past decades [1]. More recently, data-driven models such as GraphCast learn directly from historical reanalysis data and produce global medium-range forecasts in a fraction of the time physics-based systems need [2], and deep generative models have been applied to radar-based precipitation nowcasting, where forecasters preferred their output in most comparisons [3]. This body of work is largely about how accurate the forecast is. It says much less about how the forecast reaches an ordinary user and what that user does with it.

Air quality and health add another layer. The World Health Organization's 2021 global air quality guidelines set recommended exposure levels for pollutants such as fine particulate matter and ozone [5]. Consumer apps commonly display an air quality

index, but explaining what a given reading means for different ages and activities — a concern one survey respondent raised directly — is not always built into the same screen as the forecast.

Early-warning practice makes a similar point. The WMO's Early Warnings for All plan organizes multi-hazard warning systems around four pillars, including warning dissemination and communication, and preparedness and response [4]. For a consumer app, that translates into alerts that arrive on time, are specific to the user's location, and say clearly what to do.

On the personalization side, the recommender-systems literature has long treated context — location, time, and the user's situation — as an important input for useful suggestions [6]. Weather is a natural context signal: the right clothing, meal, or travel advice depends on the temperature, rainfall, and air quality where the user actually is.

The tools for building such an app have matured as well. React Native lets developers write one JavaScript codebase for both Android and iOS [7]. Node.js and Express provide a lightweight API layer [8], [9], MongoDB Atlas offers a managed cloud database [10], Firebase Cloud Messaging delivers push notifications [11], and the Google Maps Platform supplies mapping and location services [12].

Together, the literature makes a solid case for accurate forecasting, actionable warnings, health-aware air quality communication, and context-aware personalization. What is less explored is bringing these strands into a single consumer app that explains the weather in plain language and converts it into personalized advice. That is the gap this paper addresses. Rather than relying on literature alone, this study also grounds its design in primary survey data on what weather-app users actually check, how they rate their current app, and which AI features they want.

III. Problem Statement and Research Gap

A. Problem Statement

Weather apps have made forecasts easy to reach, but turning a forecast into a decision is still left to the

user. Most apps display temperature, humidity, rain probability, pressure, and wind speed, and expect people to work out what to wear, whether outdoor plans are safe, and whether travel should change.

Users who are less used to reading weather data — or who are planning for children or older family members — get the least help.

Health and comfort advice is another weak spot. Air quality is often shown as a number or a color band without explaining what it means for breathing, exercise, or different age groups. Hydration, food, and sleep are rarely linked to the day's conditions, and travel planning usually means checking a destination's weather separately from everything else.

Trust and accuracy matter too. Survey respondents asked for correct daily forecasts, real-time updates for their own location, and district-level or hyperlocal alerts. One also cautioned against becoming dependent on AI. Any assistant has to be honest about the data it relies on and clear that its advice is a guide, not a substitute for judgment.

The survey supports these challenges. Existing apps averaged only 3.60 out of 5, with 41.3% of respondents rating them three or below. At the same time, 78.8% said they wanted an AI assistant that explains the weather in simple language, and 63.8% named simple explanation as the AI feature they wanted most.

So the main problem this research aims to solve is the lack of an accessible weather application that turns real-time weather and air quality data into plain-language, personalized, actionable guidance in one place.

B. Research Gap

The literature review and survey results show gaps in current solutions:

Interpretation gap: Apps present data; users must decide for themselves what it means for clothing, activity, and travel.

Health and air quality context: AQI values appear without age-appropriate precautions or any link to daily activity.

Limited personalization: Advice rarely reflects the user's own profile — age, weight, or activity level — even for something as basic as how much water to drink.

Actionable, location-aware alerts: Users want timely, hyperlocal alerts with clear preventive steps rather than raw warnings.

Fragmented planning: Travel, health, and daily-routine decisions mean switching between different tools.

Trust and responsible AI: Users want accuracy, and some worry about over-reliance. Recommendations need to be clearly advisory.

User-driven requirements: There is room to prioritize weather-app features directly from what users say they want, rather than from assumptions.

TABLE I
Feature Comparison: Typical Weather Apps vs. SkyMate

Feature	Typical apps	SkyMate
Current weather	Yes	Yes
Forecasting	Yes	Yes
Plain-language AI explanation	Limited	Yes
Clothing recommendation	Rare	Yes
Food suggestion	Rare	Yes
Water-intake calculator	Rare	Yes
Outdoor activity and sleep guidance	Rare	Yes
Travel planner	Limited	Yes
AQI health advisory	Partial	Yes
Weather alerts	Yes	Yes
Sky viewing and photography alerts	Limited	Yes

C. Proposed Research Approach

To address the gaps surfaced by the literature review and primary survey, this study proposes a single mobile application that brings weather data, air quality, location, and AI-generated guidance together. Users open the app and see current conditions, a plain-language explanation of what they mean, and suggestions on clothing, food, hydration, activity, sleep, and travel; alerts warn them when conditions turn severe, and a Sky Moments section points out interesting skies and astronomical events.

The app's core features — real-time weather, AQI monitoring, an AI weather assistant, lifestyle and health advisors, a travel planner, and alerts — were not chosen independently. They were drawn directly from the pain points and expectations identified through the review and survey. In that sense, the design follows the users' stated needs rather than a predetermined feature list.

The underlying goal is to close the distance between weather information and everyday decisions. Bringing forecasts, air quality, explanations, and personalized advice together in one system is meant to make weather information easier to understand, more useful, and more timely for the person holding the phone.

IV. Research Methodology

This research follows a user-oriented methodology that combines survey-based requirement identification with the design and development of a mobile weather application. The process was structured across seven stages, shown in Fig. 1.

The study began by identifying core weaknesses of existing weather apps — data without interpretation, limited health and travel guidance, and generic alerts. A literature review of forecasting, air quality communication, early warnings, and recommender systems then helped establish the research gap. A user survey gathered direct evidence on how people use weather apps, how satisfied they are, and which AI features they want; responses were analyzed using percentage-based descriptive methods.

Survey and literature findings were translated into functional requirements — a home dashboard, an AI weather assistant, lifestyle advisors, air quality and health guidance, travel support, and alerts. These requirements shaped a client-server architecture. The application was built with React Native and Expo on the front end and Node.js, Express.js, and MongoDB Atlas on the back end, with Firebase Cloud Messaging for notifications. Finally, the system was reviewed against the original survey-derived requirements to confirm that it addressed what users asked for.



Fig. 1. Seven-Stage Research and Development Process

V. User Survey and Requirement Analysis

To ground SkyMate's design in real user needs, a survey examined how people currently use weather apps, how satisfied they are, and what kind of AI assistance they would value. The findings below were used to derive the application's functional requirements.

A. Survey Design

The questionnaire was administered online through Google Forms and received 80 responses. It covered two areas: current weather-app usage, including how often respondents check the weather, which weather apps they use, what information they check, and their 1–5 rating of their current app; and interest in an AI weather assistant, including whether respondents would value an assistant that explains weather conditions in simple language and which AI features they would prefer. The questionnaire

concluded with an open-ended comment box. The survey was conducted for the SkyMate project. Responses were analyzed using percentage-based descriptive statistics. For multi-select questions, percentages represent the proportion of respondents selecting each option and therefore may not sum to 100%.

B. Weather-Checking Habits

Most respondents check the weather regularly (Fig. 2). Daily checkers (27.5%) and occasional checkers (27.5%) were equally common, followed by those who check several times a week (25.0%) and those who check rarely (18.8%); one respondent (1.3%) checks only as required. Overall, 52.5% check daily or several times a week. Weather information is a routine part of the day for about half the respondents, which makes it a good candidate for a proactive assistant.

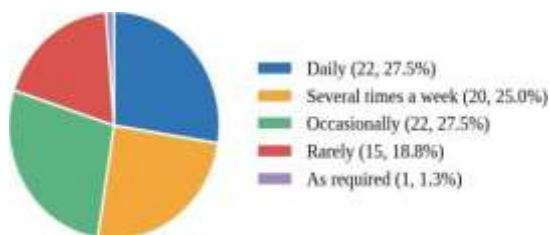


Fig. 2. How Often Respondents Check the Weather

C. Apps in Use

Google Weather dominated, named by 80.0% of respondents (Fig. 3), followed by Weather.com (16.3%) and AccuWeather (12.5%). Apple Weather was named by 2.5%. The remaining answers — Windy, a regional app, news channels, or no app at all — were single mentions. Because some respondents named more than one app, the percentages add up to more than 100%. With one app so dominant, SkyMate has to offer something beyond basic forecasting to be worth installing.

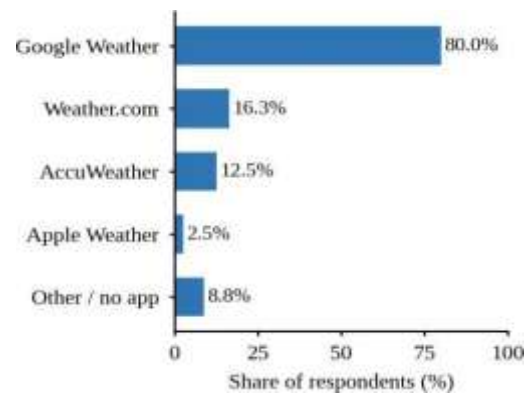


Fig. 3. Weather Apps Used Most Often

D. Information Checked

Fig. 4 shows that rain prediction is the most-checked detail (76.3%), followed by temperature (63.8%) and weather alerts (41.3%). Air quality (27.5%) and humidity (16.3%) were checked less often. Rain and temperature are what people need for immediate decisions, so they are the first things the dashboard has to get right, with alerts and AQI alongside.

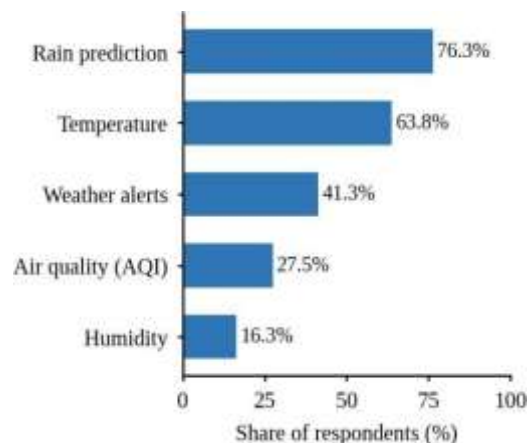


Fig. 4. Weather Information Respondents Usually Check

E. Satisfaction with Existing Apps

Respondents rated their current app 3.60 out of 5 on average (Fig. 5). Ratings of 4 or 5 made up 58.8% of responses, but a quarter (25.0%) gave a 3 and 16.3% rated the app 1 or 2. Satisfaction is decent but far from strong, which leaves room for improvement even for users of well-known apps.

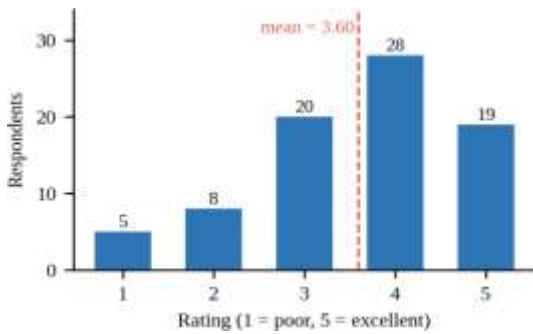


Fig. 5. Respondents' Rating of Their Current Weather App

F. Demand for an AI Weather Assistant

Of the 80 respondents, 78.8% said yes to an AI assistant that explains the weather in simple language, 13.8% said maybe, and only 7.5% said no (Fig. 6). Counting "maybe" as openness, 92.5% did not rule the idea out. This is strong validation for SkyMate's core premise.

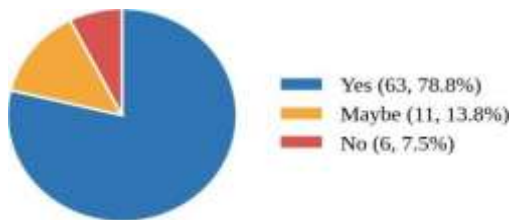


Fig. 6. Interest in an AI Weather Assistant

G. Preferred AI Features

Simple weather explanation was the most-wanted AI feature (63.8%), ahead of personalized alerts (45.0%), travel suggestions (41.3%), health recommendations (41.3%), and farming advice (40.0%) (Fig. 7). A few write-in answers asked for construction-related guidance and for advance warnings of extreme events such as heavy rainfall and earthquakes, along with preventive measures; one respondent said they cannot use AI. Explanation comes first and personalization second, while domain advice — travel, health, farming — sits close behind, so all three areas matter. Earthquake warnings, however, fall outside the scope of a weather app.

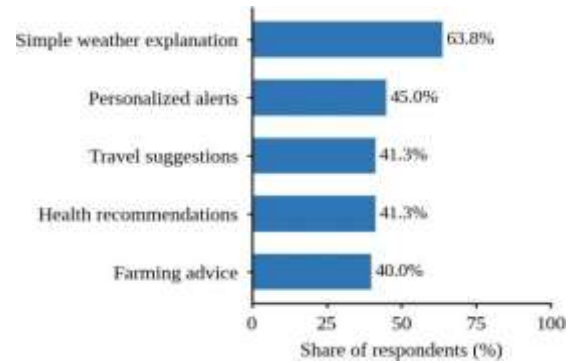


Fig. 7. AI Features Respondents Would Like Most

H. Open-Ended Feedback

Roughly a quarter of respondents left substantive comments; most others wrote "no" or left the box blank. Four themes stood out. **Accuracy:** about four respondents stressed correct daily forecasts and travel suggestions, one noting that forecasts in some European countries feel more reliable than in India.

Real-time, location-specific data: several asked for updates for their exact location, district-wise forecasts, and hyperlocal alerts. **Alerts:** respondents wanted rain alerts and advance warnings before calamities. **Ease of use:** about three comments asked for a user-friendly app that runs smoothly and gives easy-to-understand output.

Individual comments also asked for multilingual support, monthly and seasonal forecasts, guidance on how local air quality from construction and travel affects health across age groups, and one app with many uses. One respondent cautioned against becoming dependent on AI.

Overall, the survey findings provided a user-centered basis for prioritizing requirements. Real-time weather with rain and temperature up front, an AI assistant that explains conditions in plain language, personalized alerts, and health and travel guidance form the primary functional requirements. Regional-language support, farming advice, and longer-range outlooks represent potential areas for future development.

VI. Proposed SkyMate Framework

A. Overview

Drawing on both the literature gaps and the survey findings, this research proposes SkyMate, a single mobile application that gathers weather, air quality, and location data, analyzes it with an AI recommendation layer, and presents the result as plain-language guidance. Instead of a grid of numbers, users see what the conditions mean for them: what to wear, how much water to drink, when to go out, whether to travel, and what health precautions to take. SkyMate also extends beyond conventional forecasting with Sky Moments, which connects weather information with sky observation, photography, and astronomical-event awareness.

B. System Architecture

SkyMate follows a client-server design (Fig. 8). The React Native app, built with Expo and using Redux Toolkit for state management, is the user's only interface. It calls a Node.js and Express.js API that authenticates the user with JWT, retrieves weather, air quality, geolocation, and map data from external APIs, and passes the combined conditions to an AI recommendation module. User data — profiles, favorite cities, search history, travel plans, alert preferences, and settings — is stored in MongoDB Atlas, and Firebase Cloud Messaging pushes alerts back to the device.

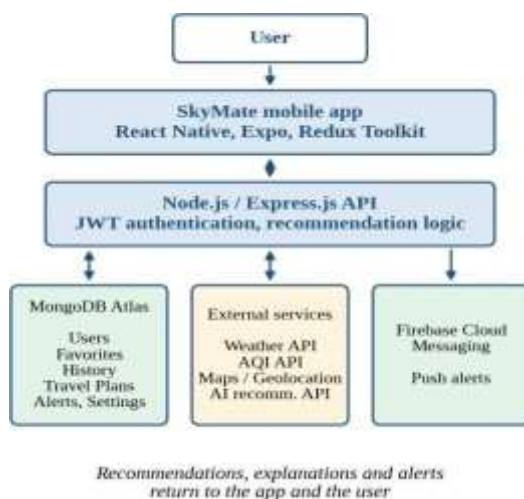


Fig. 8. Architecture of the SkyMate Application

C. Modules

The system is built from thirteen modules covering the path from data to advice: authentication; a home

dashboard showing temperature, humidity, wind speed, pressure, UV index, AQI, sunrise and sunset, and rain probability; an AI weather assistant; a smart clothing advisor; a smart food recommendation module; a water-intake calculator; an outdoor activity planner; sleep quality prediction; a travel planner; an air quality center; a health advisory; an emergency mode for severe-weather alerts; and Sky Moments (Section VI.F).

D. Workflow

When the user opens SkyMate, the app first retrieves the current location through GPS. The backend then fetches weather data and air quality information for that location, and the AI engine analyzes the combined conditions. Personalized recommendations are generated and shown on the dashboard, and notifications are sent when conditions call for them.

E. Recommendation Logic

Recommendations combine simple rule-based thresholds with AI-generated explanations. For example, when the temperature rises above about 35 °C, SkyMate suggests light cotton clothing, raises the daily water-intake target, and advises avoiding the afternoon sun. When rain probability exceeds about 70%, it suggests carrying an umbrella and wearing waterproof footwear, and shows a travel alert. The water-intake calculator draws on temperature, humidity, age, weight, and activity level. All recommendations are advisory only.

F. Sky Moments

Sky Moments is a distinctive feature of SkyMate that combines real-time weather conditions with astronomical events and atmospheric information to identify potentially interesting sky-viewing and photography opportunities. It analyzes factors such as cloud cover and cloud conditions, sunrise and sunset timings, visibility, precipitation probability, atmospheric conditions, and astronomical events to generate relevant notifications.

The Sky Moments section can display nine kinds of alerts (Table II). Rather than asking users to interpret cloud and light data themselves, it flags a window of time and explains why it may be worth looking up. Lightning-related alerts come with appropriate safety precautions, since watching storms carries real risk.

TABLE II
Sky Moments Alert Types

Alert	What it identifies
Golden hour	Periods around sunrise and sunset with warm, attractive natural light
Colorful sky	Weather and lighting conditions that may create visually interesting skies
Cloud photography	Cloud and lighting conditions that may suit cloud photography
Rainbow	Conditions that may be favorable for rainbow visibility
Eclipse	Upcoming solar and lunar eclipses and expected viewing periods
Meteor shower	Upcoming meteor showers and suitable viewing periods
Moon events	Notable lunar events and viewing opportunities
Lightning photography	Conditions potentially suitable for observing lightning, with safety precautions
Dramatic cloud	Interesting cloud formations or changing atmospheric conditions

The feature is provided as a dedicated section within the Smart area of the app (Smart → Sky Moments). SkyMate’s AI layer combines the weather and astronomical information and writes short, understandable descriptions. A cloud photography alert, for instance, reports that favorable cloud cover and evening lighting have been detected and that this may be a good opportunity for sky photography. During a significant astronomical event, the app instead shows an event notification asking users to check the event timing and local visibility conditions to plan their observation. Alerts are worded as possibilities rather than promises, because sky conditions cannot be guaranteed.

G. Research Contribution

The main contribution is treating the weather forecast as the input to a decision-support pipeline rather than the end product. Paired with survey-driven priorities — plain-language explanation first,

personalization and alerts second, health and travel guidance close behind — this directly tackles the interpretation gap that both respondents and the literature point to. Sky Moments adds a second contribution: it extends a weather app beyond forecasting by linking weather information with sky observation, photography, and astronomical-event awareness.

VII. System Design and Implementation

A. Technology Stack

The front end is built with React Native and Expo, using Redux Toolkit for state management and React Native Chart Kit for charts. The back end runs on Node.js and Express.js with MongoDB Atlas as the database. Authentication uses JWT and Google Login, Firebase Cloud Messaging delivers push notifications, and Google Maps supports location features. The external services are a weather API, an air quality API, the Google Maps and Geolocation APIs, the Firebase Cloud Messaging API, and an AI recommendation API.

B. Architecture and Database

The app follows a client–server model: the React Native front end talks to the Node.js and Express.js API, which in turn talks to the database and external services. MongoDB Atlas holds six collections. Users stores profile details, authentication data, and preferences. Favorites stores favorite cities. Weather History stores search history. Travel Plans stores travel schedules. Alerts stores notification preferences, and Settings stores application settings. Each record is tied to the user’s account, so saved cities, plans, and alert preferences follow the user when they sign in again.

C. Authentication

Users can sign up and log in with email or Google Login. Sessions are secured with JWT, and a password-recovery flow is provided for email accounts.

D. Home Dashboard

Once GPS returns the user’s location, the dashboard shows current temperature, humidity, wind speed, pressure, UV index, AQI, sunrise and sunset, and rain probability (Fig. 9a). It covers the details respondents check most — rain probability and

temperature — alongside the air quality and alert information they also asked for.

E. AI Weather Assistant and Lifestyle Advisors

The AI weather assistant explains current conditions in simple language and gives suggestions (Fig. 9b). Around it sit the lifestyle advisors. The clothing advisor suggests cotton clothing, jackets, hoodies, raincoats, or UV protection. The food module suggests weather-appropriate food. The water-intake calculator estimates daily hydration needs. The outdoor activity planner recommends suitable times for being outside, and the sleep module offers environmental tips for better rest.

F. Air Quality Center and Health Advisory

The air quality center displays AQI along with explanations of its health impact (Fig. 9c). The health advisory builds on the same data and gives recommendations based on weather and air quality together, responding to the survey comments that asked how local air quality affects health and what precautions to take.

G. Travel Planner, Alerts, and Emergency Mode

The travel planner analyzes weather conditions at a destination, and travel schedules are saved in the user's Travel Plans collection. Emergency mode raises alerts during severe weather, and Firebase Cloud Messaging delivers them as push notifications according to the alert preferences the user has saved.

H. Sky Moments

Sky Moments is implemented as a dedicated section in the Smart area of the app. It draws on the cloud cover, sunrise and sunset timings, visibility, and precipitation probability the app already gathers, together with astronomical event information, and sends a notification when a favorable viewing window is detected (Fig. 10). The section lists the current and upcoming alerts by type, from golden hour and colorful sky to eclipses, meteor showers, moon events, and lightning photography, with safety precautions attached to the lightning alerts.



Fig. 9. SkyMate Screens: (a) Home Dashboard, (b) AI Weather Assistant



Fig. 10. Example Sky Moment Alert

VIII. Evaluation and Results

This evaluation reflects where SkyMate stands right now, a working first version rather than a finished product. Several planned features are still ahead.

A. Functional Evaluation

The current build covers authentication, the home dashboard, the AI weather assistant, the clothing, food, water-intake, outdoor-activity, and sleep advisors, the air quality center and health advisory, the travel planner, alerts with emergency mode, and Sky Moments. The core loop — detect the location, fetch weather and air quality data, generate recommendations, and display them, with notifications when needed — is in place.

B. Survey-to-Feature Evaluation

The survey directly steered priorities (Table III). Strong demand for an AI assistant (78.8%) and for

simple explanation (63.8%) placed the AI weather assistant at the center of the app. Interest in personalized alerts (45.0%) shaped alerts and emergency mode. Travel (41.3%) and health (41.3%) suggestions led to the travel planner and health advisory. Farming advice (40.0%) was left for a future release rather than forced in now. Sky Moments is the exception: the survey did not ask about it, so it is a design extension rather than a survey-derived requirement, and how much users value it has not yet been measured.

TABLE III
Survey Findings and SkyMate's Response

Survey finding	Result	SkyMate response
Wants AI that explains weather simply	78.8% yes; 63.8% top feature	AI weather assistant
Personalized alerts	45.0%	Alerts, emergency mode, push notifications
Travel suggestions	41.3%	Travel planner
Health recommendations	41.3%	Health advisory, air quality center
Rain and temperature checked most	76.3%; 63.8%	Dashboard
Air quality checked	27.5%	Air quality center
Farming advice	40.0%	Planned for a future release
Multilanguage support	Individual comments	Planned for a future release

C. Current Implementation Status

As it stands, the app delivers its thirteen core modules — enough to show that the idea of turning forecasts into plain-language guidance works in practice. Regional-language support, farming advisories, longer-range outlooks, and wearable integration are still pending. These results should be read as a first-version snapshot, not a full evaluation of the finished vision.

D. Usability and User Acceptance

No formal usability testing has been run on the app itself yet. The survey measured what users wanted, not how well the build performs. That testing is a separate next step: real users working through the app, measured on ease of use, task completion, satisfaction, and how useful the recommendations feel, ideally with a structured usability framework.

E. Performance Evaluation

Performance testing has not happened either. As the build matures, it will need testing under realistic conditions — response time of the weather and AQI calls, speed of AI recommendations, notification delivery, behavior on weak connections, and how the Node.js and MongoDB back end scales with more users.

IX. Discussion

The survey results were central to shaping what SkyMate needed to do. With 78.8% of respondents wanting an AI assistant that explains the weather in simple language, and simple explanation ranking first among AI features (63.8%), the case for an interpretation-first design was clear. The 3.60 average rating of current apps, with 41.3% rating them three or lower, suggests that even familiar apps leave room for improvement.

Beyond the overall concept, the survey also shaped individual features. Alerts mattered on two counts: 41.3% already check them and 45.0% want personalized ones, which led to push notifications and emergency mode. Travel and health advice, each wanted by 41.3%, led to the travel planner and the health advisory built on the air quality center. Because rain (76.3%) and temperature (63.8%) are what people check most, the dashboard makes sure both are covered.

These choices line up with earlier work that treats warning communication and preparedness as essential [4], stresses health-relevant air quality information [5], and uses context to personalize suggestions [6]. What this study adds is bringing these ideas together in one app and grounding the feature set directly in primary survey data rather than assumptions.

Sky Moments illustrates a different kind of design choice. The survey did not ask about it; it comes from the project's aim of connecting weather information with everyday interaction, and it builds on weather data the app already gathers, such as sunrise and sunset, cloud conditions, visibility, and rain probability. Whether users find it valuable is an open question for the usability testing described below.

One tension deserves mention. Free-text comments put accuracy first — correct daily forecasts, real-time data, location-specific alerts — while SkyMate's AI layer adds interpretation, not measurement. The app can make a forecast easier to understand and act on, but it can only be as accurate as the weather and air quality data feeding it. Another comment cautioned against dependence on AI, which supports keeping every recommendation advisory.

A few limitations should be noted. The app is a first version, and formal evaluation of usability, performance, and user acceptance has not yet been carried out, so it is too early to draw firm conclusions about how well the complete system works. That evaluation, with a larger and more varied group of users, is the natural next step.

X. Limitations and Future Scope

A. Limitations

A few limitations are worth acknowledging. To start, SkyMate is still a work in progress. Several features that respondents mentioned — regional-language support, farming advice, and longer-range forecasts — are not part of the current build.

The survey also has a specific scope. It gathered 80 responses through an online form, so its results show clear trends but should not be treated as precise estimates for all weather-app users. It captured preferences and frustrations around existing apps; it was not a usability test of SkyMate itself, so it can say what users want but cannot judge how well the implemented system performs.

The app also depends on things outside its control. It needs an internet connection, and the accuracy of its guidance depends on third-party weather and air quality APIs. Some advanced APIs may need paid subscriptions, and GPS accuracy varies across devices. AI recommendations are advisory only and are not medical advice. Sky Moments alerts are indicative rather than guaranteed: cloud and light

conditions can change quickly, local visibility varies, and the alerts depend on the accuracy of the underlying weather and astronomical information, so lightning-related alerts must always be paired with safety guidance. Finally, some requests — such as earthquake warnings — fall outside the scope of a weather application.

B. Future Scope

Going forward, the priority is to add regional-language support, which several respondents asked for, and an agricultural weather advisory service, given that 40.0% wanted farming advice. Hyperlocal alerts and longer-range outlooks are also worth exploring, since respondents asked for location-specific warnings and monthly or seasonal forecasts.

Beyond that, the roadmap includes smartwatch and wearable-device connectivity, more advanced machine-learning personalization, smart-home integration, an enhanced voice assistant, and integration with fitness applications. Sky Moments can also be tested with photography and astronomy enthusiasts to check the timing and usefulness of its alerts, and extended with further event types. These can be rolled out gradually and refined as the system matures.

Once the app reaches a more stable state, the next step is a full evaluation with a larger, more varied group of users — looking at usability, task completion, satisfaction, response times, reliability, and scalability. That testing will give real evidence of how well the approach holds up in practice.

XI. Conclusion

This work set out to tackle a common problem: weather apps show data, but people still have to work out what to do with it. The solution proposed here is SkyMate, a single mobile application that combines real-time weather, air quality, and location data with an AI recommendation layer, explaining conditions in plain language and turning them into suggestions on clothing, food, hydration, activity, sleep, travel, and health, while a Sky Moments feature connects weather with sky observation, photography, and astronomical-event awareness.

Survey data guided the core design decisions. A large majority of respondents (78.8%) said they would like an AI assistant that explains the weather in simple language, and simple explanation was the most-wanted AI feature (63.8%). Current apps averaged only 3.60 out of 5. Beyond that, the survey

pointed to specific needs — rain and temperature at a glance, personalized alerts, travel and health guidance, and accurate, location-specific information — all of which shaped the requirements.

On the technical side, SkyMate was built with React Native and Expo for the mobile front end, Node.js and Express.js for the API, MongoDB Atlas for storage, Firebase Cloud Messaging for notifications, and Google Maps for location features. What has been built so far covers a dashboard, an AI weather assistant, lifestyle and health advisors, an air quality center, a travel planner, alerts, and Sky Moments.

It is worth being clear that this is a working first version, not a finished product. Regional-language support, farming advice, longer-range outlooks, and wearable integration are still on the roadmap, and the app still needs thorough usability, performance, and user-acceptance testing before its real-world effectiveness can be confirmed. In short, this project shows what a requirements-driven approach to a weather assistant can look like — combining forecasts, air quality, and personalized advice in one place lays useful groundwork for helping people act on the weather, not just read it.

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