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Progress Report

Meghdoot mobile app: Upgrades in 2023

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Background

The Meghdoot mobile app was developed in the year 2020 to provide location and crop specific weather-based agro-advisories across India. The app was refined after receiving suggestions and feedback from various experts in the field. Meghdoot presents observed and forecast information on temperature, rainfall, wind direction and humidity downscaled to a specific location along with an agromet advisory generated and managed by the India Meteorological Department (IMD) and Indian Institute of Tropical Meteorology (IITM). The design and architecture of Meghdoot benefited from the reference architecture of two previous applications developed by ICRISAT with support from CCAFS: The Sowing App and the Intelligent Agricultural Systems Advisory Tool (iSAT). Both these applications demonstrated the effective use of software to support generation of agrometeorological advisories. The DI team at ILRI is building off from the collaborations and outputs from erstwhile CCAFS and continuing to co-design improvements to Meghdoot as well as the backend platform with IMD and IITM.

Progress

Meghdoot app has shown steady growth and expansion since the beginning. At the time of its launch, it provided agro-metrological advisories to only 150 districts in India. However, the Meghdoot app has expanded its reach to 717 districts in the country. This achievement comes along with the development of a multilingual strategy to cater to the non- English-speaking community in India and provide the information in 12 languages which includes

Hindi, Telugu, Assamese, Gujarati, Kannada, Malayalam, Marathi, Odia, Tamil, Mizo, Bengali, and Punjabi, which has tremendously increased the reachability of the app. The app has also seen significant uptake with around 294,000 downloads and installations as of December 2023. This data underscores the significant advancement and widespread usefulness of Meghdoot in disseminating vital agro-meteorological advisories to farmers and stakeholders nationwide.

Significant upgrades in 2023

Meghdoot app is evolving, and continuous upgrades and features are added periodically. Below are few of them:

1. **Offline mode**: The app now features an enhanced offline mode which allows users to access downloaded advisories even when they are not connected to the internet. This feature ensures that the farmers in remote locations with limited internet connectivity can still benefit from the personalized crop advisories and weather information.
2. **Alerts and Notifications**: The users will now receive push notifications as soon as a new crop advisory is added to the app for the selected locations. This alert system ensures that the farmers are updated on the latest information and can take timely action to protect their crops and optimize their yields.
3. **Social media integration**: The app now includes seamless integration with social media platforms such as Facebook and WhatsApp allowing users to easily share valuable information with their friends and peers.
4. **Operating System update**: The Android version of the app has been upgraded to support the latest Android 13. This update ensures a smoother user

experience for all Android users by bringing bug fixes and performance optimizations in addition to new features and improvements.

5. **Database upgrade and scheduler implementation**: To address the challenge of limited database storage and ensure timely updates of new advisories, a scheduler has been introduced. This scheduler automates the process of updating advisories in the app's database, ensuring that users always have access to the most current information without experiencing delays or interruptions.
6. **Comprehensive dashboard development**: A visually engaging dashboard has been developed to provide AAS staff at IMD with insights into app usage and adoption at both the district and state levels. This comprehensive dashboard offers valuable analytics and data visualization tools, empowering policymakers, and stakeholders to make informed decisions and allocate resources effectively.
7. **Utilization of Artificial Intelligence (AI)**: To enhance the quality in terms of content and reduce the time required to develop crop advisories and weather summaries, we are exploring the utilization of OpenAI. A technical report on a pilot project has also been created. This pilot utilizes OpenAI architecture for natural language processing and a Random Forest regressor for predictions. A pilot study has been conducted at 3 locations in India and the results have been promising. Improvements are being explored in terms of adding new features to the Machine Learning (ML) model as well exploring the possibility to use techniques like noisy labels as well as the use of expert knowledge to improve the training data to improve the performance of ML models. A separate concept note has also been prepared to explore the potential funding from Government of India as well as through other donors is also being explored. Eventually, the objective is to expand this model to cover all locations and crops within the Meghdoot app.