



**Invitation for quotations for the development of
Android mobile application and Web-based platform for the Admin
Dashboard for IoT enabled Automatic Weather Station (AWS) to be
developed under CAAST-CSAWM, MPKV Rahuri...**

Subject: Invitation for quotations for the development of Android mobile application and Web-based platform for the Admin Dashboard for IoT enabled Automatic Weather Station (AWS) to be developed under CAAST-CSAWM, MPKV Rahuri...

1. The experienced IT firm/agencies are invited to submit their most competitive quotation for the following goods and services.

Development of Android mobile application and Web-based platform for the Admin Dashboard for IoT enabled Automatic Weather Station (AWS) to be developed under CAAST-CSAWM, MPKV Rahuri		
Sr. No.	Specifications (Scope of work)	Quantity
1.	<p>Description: Android mobile application and Web-based platform for Admin Dashboard for IoT enabled Automatic Weather Station (AWS) needs to be developed for end-users/ farmers as detailed below-</p> <p>A. Android mobile application:</p> <ol style="list-style-type: none">1. Registration: Registration of user/farmer including Name, Mobile Number, Address, Farm/Location Name, AWS type, Latitude and Longitude etc. After scanning the QR code of the corresponding AWS type, the AWS should be registered and added its details to the mobile application. The QR code should be unique for each type of AWS.2. Fetching of data: To fetch the corresponding data of weather parameters as per AWS type from the registered AWS of the user by using appropriate means such as through the cloud server of this project.3. To estimate the derived parameters such as hourly/ daily/ weekly/ monthly averages or total ETr.4. Displaying of the data: To display the data of corresponding weather parameters including derived parameters as per AWS type as briefed below<ul style="list-style-type: none">• Style: In form of graph/figures and numerical values• Interval: 1 to 60 min. as per need, hourly, daily, weekly and monthly	01

	<p>5. Generation of reports: The reports to be generated for the data stated in sr. no. 4 that can be downloaded, saved and transported.</p> <p>B. Web-based admin dashboard (Web application)</p> <ol style="list-style-type: none"> 1. Registration: Registration of admin generating User ID and Password. 2. Fetching of data: To fetch the corresponding data of weather parameters as per AWS type from the different users/ farmers registered on the Android mobile application (Sr. No. A.1.) by using appropriate means such as through the cloud server of this project. 3. Displaying of the data: Admin should be able to view the data of all users/farmers registered on the Android mobile application. The data contains the User information, the AWS type and the related weather parameters, including the derived parameters of the AWS type as briefed below. <ul style="list-style-type: none"> • Users: List of users as per the location (State, district, taluka and village) and AWS type. • Style: In form of graph/figures and numerical values • Interval: 1 to 60 min. as per need, hourly, daily, weekly and monthly 4. Generation of reports: The reports to be generated for the data stated in sr. no. 4 that can be downloaded, saved and transported by the admin. 5. Addition of AWS type or other IoT device: <ul style="list-style-type: none"> • The admin should able to add different IoT Enabled AWS types and Other IoT devices in the CMS along with the output parameters and unit of measurement. • Users should be able to define the derived values along with the formula for calculation in the CMS for each AWS type and IoT device. <p>C. Other:</p> <ul style="list-style-type: none"> • Development of Android mobile application and Web application with database. • Development of Web APIs for communication between Firmware and the Cloud, Communication between cloud and CMS, Communication between Cloud and Mobile Application. • QR Code should be generated during the registration of each AWS type/ IoT device, that QR code should be unique and will differentiate each IoT device. • Mobile app should display IoT device data in the format of numeric and Graph format. Data to be fetched from Web API. • Admin (web-based) dashboard should have admin login which will have User Name and Password. • After successful login, the user (admin) should have access to the dashboard for AWS installed at different locations. • Admin should be able to add AWS of different types or other IoT devices by selecting components or sensors given to the device. • AWS/ IoT device reading fetched by the corresponding sensors need to be displayed on the Android app and Admin dashboard in numeric and in graph format. 	
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	<ul style="list-style-type: none"> • AWS/ IoT device data need to be exported to XLS format. <p>D. Programming:</p> <ul style="list-style-type: none"> • The android mobile app should work on 5.1 onward based mobile phone and tablets. • Latest version of Android development to be used. • The design of the app should be farmer or user friendly with English and Marathi language support. • Technologies suggested to use for the development <ul style="list-style-type: none"> • Android Development: Android Studio tool 4.0.1, Language Java 1.8.1, Database SQLite, Graddle 4.10 or other competitive platforms. • Web Application: C# .Net core, Angular, MS SQL Server or other competitive platforms. • Full implementation <p><i>(Detailed proposal is attached as an Appendix-A)</i></p>	
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2. Government of India has received a financing from the International Bank for Reconstruction and Development (IBRD) in various currencies towards the cost of the National Agricultural Higher Education Project (NAHEP) and intends to apply part of the proceeds of this Loan to eligible payments under the contract for which this invitation for quotations is issued.

3. Bid Price

- a. The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialing, dating and re writing.
- b. All duties, taxes and other levies payable on the raw materials and components shall be included in the total price.
- c. Sales tax in connection with the sale shall be shown separately.
- d. The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
- e. The Prices shall be quoted in Indian Rupees only.

4. Each Bidder should submit only one quotation.

5. Validity of Quotation

Quotation shall remain valid for a period not less than 15 days after the deadline date specified for submission.

6. Evaluation of Quotation

The Purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which

- (a) Are properly signed; and
- (b) Confirm to the terms and conditions, and specifications.

The Quotations would be evaluated for the entire item together (Scope of work mentioned in Appendix A)

7. Award of Contract

The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.

7.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.

7.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

8. The successful bidder has to handover the developed Android mobile application and Web based application within 20 days from the receipt of work order.
9. The firm should provide proof of GST registration number / TIN / PAN No.
10. The payment will be made on actual receipt of source code and satisfactory deployment of Android mobile application and Web based application.
11. The Bidders are requested to provide their offer latest by **1800 hours** on or before **01/03/2021 in the name of “Principal Investigator, CAAST-CSAWM, MPKV Rahuri, 413 722.**
12. Envelope should be super scribed as **“Quotations for the development of Android mobile application and Web-based platform for the Admin Dashboard for IoT enabled Automatic Weather Station (AWS) to be developed under CAAST-CSAWM, MPKV Rahuri”**
13. The bidder should provide the wireframe/mock up diagrams for the entire procedure given in **Appendix-A** at the time of pre-Bid meeting.
14. The bidder can contact this office on caast.csawm2018@gmail.com for any queries regarding technical details / procedure.
15. The successful bidder needs to provide entire source code of the developed Android mobile application and admin dashboard.
16. The provided Android mobile application and web-based platform of admin dashboard would be property of CAAST-CSAWM, MPKV, Rahuri.
17. The application and admin dashboard should be developed by considering the anticipated advances in the IoT and mobile communication technology.
18. The bidder will be responsible to provide support post-deployment/installation of the service at CAAST-CSAWM, MPKV, Rahuri for **atleast one year** and need to **sign project agreement** for this purpose.
19. **Important dates:**
 - a. **Date of issue of RFQ:** 15/02/2021
 - b. **Date of pre-Bid meeting:** 23/02/2021 (Time: 1400 to 1600 hrs)

The perspective bidder can participate in pre-Bid meeting and also give presentation. The pre-Bid meeting is arranged in online/offline mode. The bidders willing to participate in pre-Bid meeting, should email: caast.csawm2018@gmail.com regarding as to whether they wish to participate offline/online based on which the details of meeting will be communicated to them.

Offline pre-Bid meeting venue: *The Centre for Advanced Agricultural Science and Technology for Climate Smart Agriculture and Water Management (CAAST-CSAWM), Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri, 413 722, Ahmednagar, Maharashtra.*

Online pre-Bid meeting: *Zoom platform (Link ID and password will be shared on 22/02/2021 through email.)*

c. **Last date to submit quotation:** 01/03/2021.



**Procurement Officer
CAAST-CSAWM,
MPKV, Rahuri**

FORMAT OF QUOTATION

Sr. No.	Description Goods	Specifications	Qty.	Unit	Quoted Unit Rate in Rs.	Total Amount	
1.	Development of Android mobile application and Web-based platform for the Admin Dashboard for IoT enabled Automatic Weather Station (AWS) to be developed under CAAST-CSAWM, MPKV Rahuri	Note: It should be as per specifications given at Sr. No.1 and by following all terms and conditions	01				
Total							
GST/Taxes							
Gross Total Cost							

We agree to supply the above goods in accordance with the technical specifications for a total Contract price of Rs. (Amount in figures) (Rs. amount in words) within the period specified in the Invitation for Quotations.

We also confirm that the normal commercial warrantee/guarantee of months shall apply to the offered goods.

We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Any other Terms and Conditions...

Signature of Supplier

Note: This must be provided with wireframes/mock up diagram document as per the terms and conditions given at Sr. No. i.

Appendix-A

Proposal of

Development of Android mobile application and Web-based platform for the Admin Dashboard for IoT enabled Automatic Weather Station (AWS) to be developed under CAAST-CSAWM, MPKV Rahuri ...

Preamble:

The Centre for Advanced Agricultural Science and Technology for Climate Smart Agriculture and Water Management (CAAST-CSAWM), Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri is developing an Internet of Things (IoT) enabled Automatic Weather Station (AWS) for measurement and estimation of weather data of a particular location under its one of the objectives "to develop an integrated system including RS/GIS and (GPS tools, modelling and SDSS tools using unmanned aerial system (UAS aka. Drone) and sensor-based technologies; and mobile applications and their applications for climate smart agriculture and water management".

The CAAST-CSAWM is developing different types of IoT enabled Automatic Weather Stations that need to be integrated with the Android mobile application and to be available to end-users or farmers. The real-time and derived weather data on mobile applications may be of guidance to the end-user or farmer in the planning of different farming operations, such as irrigation, fertigation, spraying, sowing, harvesting, etc. The mobile application should be in the indicative form that should be able to display weather data in both digital and graphical formats.

Also, CAAST-CSAWM, MPKV, Rahuri is developing a web application (Admin dashboard) to manage the different types of weather stations that will be installed at different locations or in a farmer's field. Admin of this web application should be able to view, download and use the weather data for research purposes.

Objectives:

1. To raise awareness among farmers and other stakeholders to help them to understand the benefits of the automatic weather station.
2. To train the stakeholders in the modification of farm operations according to weather conditions.
3. To develop an innovative and user-friendly web application which enable the user (Admin) for managing the different types of weather stations to be installed at various locations and developed by CAAST-CSAWM, MPKV Rahuri.

Salient features

A. Android mobile application

1. The full-featured Automatic weather stations developing by CAAST-CSAWM have different types of sensors for measuring weather parameters such as temperature, humidity, wind speed, wind direction, rainfall, sunshine duration and evapotranspiration (derived) etc. The details of various types of AWS are provided in Table 1.

Table:1 Type of Automatic Weather Stations (AWS) and weather parameters

Weather parameters	Type of Automatic Weather Stations (AWS)					
	Type-1	Type-2	Type-3	Type-4	Type-5	Type-6
Temperature	√	√	√	√	√	×
Humidity	√	√	√	√	×	×
Rainfall	√	√	√	×	×	√
Solar radiation	√	×	×	×	×	×
Wind speed	√	√	×	×	×	×
Wind direction	√	√	×	×	×	×
Evapotranspiration	√	×	×	×	√	×

2. The user should register their own automatic weather station by providing following information in the mobile application.
 - a. User Name
 - b. Mobile Number
 - c. Address
 - d. Farm/Location Name
 - e. AWS Details (Type)
 - f. Latitude
 - g. Longitude
 - h. Elevation
3. Provision of QR code scanner for registration of AWS and add its details to the mobile application. The QR code should be unique for each type of AWS.
4. Assigning the AWS ID, if the user having more than one type AWS installed.
5. Provision of Alert message for deregistration/ deactivation, if the AWS is already registered.
6. One Time Password (OTP) based reregistration of automatic weather station.
7. Fetching the corresponding data of weather parameters as per AWS type from the registered AWS of the user by using appropriate means such as through the cloud server of this project. Weather data includes:
 - a. Current data (real time information of weather parameters)
 - b. Periodic data (Information of weather parameters for the specific period selected by the user)
 - c. Derived parameters such as hourly/ daily/ weekly/ monthly averages or total i.e. minimum and maximum temperature, minimum and maximum relative humidity and evapotranspiration (ETr) etc.

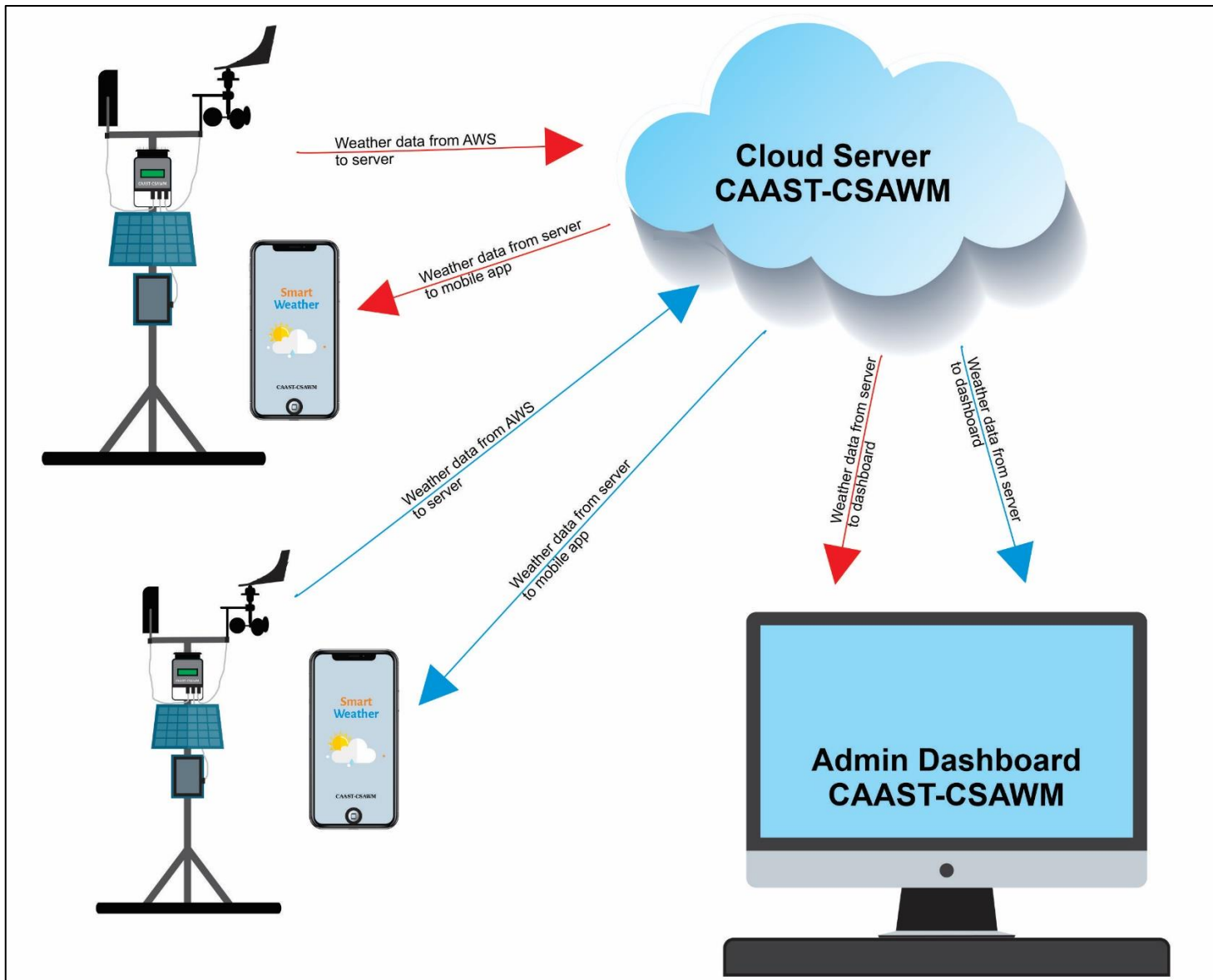
8. Display the data of corresponding weather parameters including derived parameters as per AWS type as briefed below,
 - a. Style: In form of graph/figures and numerical values
 - b. Interval: 1 to 60 min. as per need, hourly, daily, weekly and monthly
9. The reports to be generated for the weather data stated above that can be downloaded, saved and transported.

B. Web-based admin dashboard (Web application)

1. The web application needs to be developed for managing the different types of AWS that will be installed at different locations or in a farmer's field.
2. Registration of admin generating User ID and Password.
3. To fetch the corresponding data of weather parameters as per AWS type from the different users/ farmers registered on the Android mobile application by using appropriate means such as through the cloud server of this project.
4. Admin should be able to view the data of all users/farmers registered on the Android mobile application. The data contains the User information, the AWS type and the related weather parameters, including the derived parameters of the AWS type as briefed below.
 - Users: List of users as per the location (State, district, Taluka and village) and AWS type.
 - Style: In form of graph/figures and numerical values
 - Interval: 1 to 60 min. as per need, hourly, daily, weekly and monthly
5. The reports to be generated for the data stated in sr. no. 4 that can be downloaded, saved and transported by the admin.
6. Admin should be able to add the type of AWS/ IoT device to the dashboard by providing the components or sensors given to the device.

C. After developments:

1. The developed mobile application should be
 - Work on 5.1 onward based mobile phone and tablets.
 - Farmer or user friendly with English and Marathi language support.
 - Develop under Android Studio tool 4.0.1, Language Java 1.8.1, Database SQLite, Graddle 4.10 or other competitive platforms.
 - Use SQLite database for storing local data.
2. The developed Admin dashboard (Web application) should be
 - Work on operating systems such as Windows 7/8/10.
 - User friendly with English and Marathi language support.
 - Develop under C# .Net core, Angular, MS SQL Server or other competitive platforms.



Conceptual Framework of Android mobile app and Web based Admin dashboard