

## AWARDS SCHEME FOR EXEMPLARY IMPLEMENTATION OF e-GOVERNANCE INITIATIVES

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### **NAME OF CATEGORY- 'INNOVATIVE USE OF MOBILE TECHNOLOGY IN e-GOVERNANCE'**

**1. Coverage – Geographical and Demographic :-**

(i) Comprehensiveness of reach of delivery centres,

Rainfall Recording is carried out using mobile phone from Circle level. There are no delivery centres as such in this project.

(ii) Number of delivery centres: Not applicable

(iii) Geographical

(a) National level – Number of State covered: 1

(b) State/UT level- Number of District covered: All (36)

(c) District level- Number of Blocks covered: All (358)

Please give specific details:-

The project covers all districts of Maharashtra

(iv) Demographic spread (percentage of population covered)

The project provides real-time rainfall information to anyone who visits the website

**2. Situation Before the Initiative (Bottlenecks, Challenges, constraints etc with specific details as to what triggered the Organization to conceptualize this project) :**

The project is an SMS based daily rainfall recording system implemented across 2065 circles of Maharashtra. Rainfall is measured by rain gauge stations installed at each of the circles, totaling 2065. A Circle level officer takes the reading from the rain gauge station and sends the reading by SMS (in a predefined format) which is then saved directly on the server.

The Circle level officer receives an SMS acknowledging the data collection; He/she also gets an SMS alert if there is an error in the SMS, so that he may resend the SMS

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The data thus collected is available online at [www.maharain.gov.in](http://www.maharain.gov.in) portal. Past data (from 1997) is also made available online. The portal has many analytical reports along with GIS maps which show the rainfall from Circle levels. State map with Block level boundaries and all 35 district maps with Circle boundaries showing intensity of rain are available for generation on the fly.

### **Challenges faced before implementation:**

Before this project, rain gauge stations were available only till Block level. The data collection was carried out at Block levels and collated manually at District level. It was then entered into the software at District level. This process took at least one week to get completed, and hence rainfall values were not updated in real time and significant delay was encountered.

Another major issue was that the rainfall at Circle or village levels was estimated based on the rainfall at Block (Taluka) levels. Typically, one Taluka has around 50 villages, divided in 2-3 Circles. For larger Talukas, the villages are under different climatic conditions, and hence Taluka level rainfall does not represent the true picture of actual rainfall at villages

3. **Scope of Services** (Relevance of application for e-governance, Extent to which service is delivered through mobile #)

### **Objectives of the project:**

Availability of real time rainfall data on daily basis from circle level

- Preparation of rainfall analysis to be used by all State government departments
- Planning of agriculture activities such as daily sowing, movement of fertilizers, pesticides and seeds
- Simplified rainfall data collection and storage
- Availability of data in public domain
- Availability of past data for statistical analysis and representation of the data over GIS maps

### **Roll of mobile technology:**

There are 2065 rain gauge stations in Maharashtra at Circle (village) level. Daily data collection from these stations was a challenging task. To simply this task, SMS based data collection was conceived. Thus, the mobile service in this context is an internal service which enhances the efficiency of department officers. Mobile based data collection has also reduced the time required for processing of the data.

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The system uses a Virtual Mobile Number (VMN) for collecting the data. All Circle level officers send the rainfall SMS to this number, which stores this data on the SMS gateway server. On the website, only the application server has a public IP, while the Database server has a private IP. Thus, the database is not exposed and it is available via reports and graphs.

### **Relevance of the application in eGovernance:**

#### **For government officials, Ministers, Secretaries**

During monsoon, the weather conditions are changing constantly. There is a lot of variation in the type and quantity of rainfall received within the different parts of state. The rainfall received affects many aspects of agriculture based economy, such as vegetable and food prices, agriculture commodity prices, availability of fodder for livestock as well as availability of water in the dams (for drinking, irrigation as well as industrial use). Accordingly, the government needs to take tactical and policy decisions.

The maharain website makes available exactly the same information and reports required by government officers and ministers for efficient and informed decision making.

#### **For farmers/Citizens**

Farmers/citizens have access to daily rain information since 1997 as well as current rainfall readings

#### **For statisticians, students, researchers**

The website has rainfall reading since 1997, which can be used as input for various research purposes e.g. Building weather prediction models and for agro-climatic research, to name just a few. The website also has the rainfall database categorised under heavy, normal and dry spell and their representation on maps.

#### **For private agencies such as agriculture input manufacturers (seed, fertiliser, pesticides)**

Fertiliser, seed and pesticide manufactures can predict demand based on historic rainfall and by following the current rainfall. They can plan inventory levels, stock keeping units and sales strategies.

### **4. Strategy Adopted**

#### **(i) The details of base line study done,**

The rainfall collection earlier was from Block level, and village level rainfall was estimated. This was because of lack of rain gauge stations at Circle levels. The base line study identified this as the main reason for implementing this project by installing rain gauge stations at Circle level.

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Another key factor was data collection method, which needed to be revamped if data was to be collected in time from the Circle levels. After a lot of thought, mobile (SMS) based data collection was conceived.

(ii) Problems identified,

- Motivating circle level revenue staff for recording daily rainfall using mobiles, to get 100% data. Achieved by effective training and motivation.
- Division of work between staff of Revenue and Agriculture Dept. Clarity in this aspect was provided by Hon. Chief Secretary
- Rain gauge stations at all circles were to be operational by May 2013 and there was a need to make a system available for recording within a month. To overcome this challenge, it was decided to use mobiles for rainfall recording at circle level, making it easier to train the users since they only had to send SMS in a particular format
- Getting GIS maps and software was difficult. To overcome this issue, official maps available with Agriculture dept were used, and using software, maps can be filled as per the real time rainfall data.
- Training of about 2500 users at the District, Taluka and Circle levels. NIC VC facility utilised and training of all officers was completed in 2 days

(iii) Roll out/implementation model,

The project was initiated by Agriculture department in order to gather and analyze rainfall data and make it available for decision making. Support and Guidance was provided by the Chief Secretary and the Chief Minister of the State.

The Chief Statistician of the Agriculture department coordinated with District level Revenue dept. officers to drive the data collection activity. The Circle level staff of the Revenue department was responsible for data collection.

The mobile numbers of the concerned Circle level employees were provided to the Agriculture Department and the system made it possible to monitor the data entry by each mobile. In case of any delays, the Agriculture Department contacted the District revenue officers to sort out the issues.

To motivate and drive the employees, video conferencing sessions chaired by the Chief Secretary were conducted.

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### **Roll based access:**

There are four user roles, namely State, District, Tehsil and Circle. Circle level officers are responsible for sending the data through SMS. Tehsil (block), District and State level officers can log in to the software and perform various tasks

- Circle level: Pre defined SMS based recording of rainfall
- Taluka level: Monitoring of rain recorded by their circles and update/correct if required
- District level: Monitoring of rain recorded by their circles and update/correction if required
- Division level: Overall monitoring of the work
- State level:
  - Monitoring of the work,
  - Addition/deletion of users,
  - updating mobile numbers of circle level officers
  - Defining various parameters for rainfall analysis
  - Monitoring of activity log of the system

(iv) Communication and dissemination strategy and approach used.):

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The mobile numbers of the concerned Circle level employees were provided to the Agriculture Department and the system made it possible to monitor the data entry by each mobile. In case of any delays, the Agriculture Department contacted the District revenue officers to sort out the issues.

To motivate and drive the employees, video conferencing sessions chaired by the Chief Secretary were conducted.

- Training was given to all District Collectors, Circle level officers of District Revenue Dept., Tahasildars and Talathis.
- Several VC based training sessions were conducted to explain how to use the system for all user levels.

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### 5. **Technology Platform used-**

#### (i) Description,

##### **Design:**

The website ([www.maharain.gov.in](http://www.maharain.gov.in)) is developed with open source technology. It deploys 3 tier MVC design (Model-View-Controller).

The GUI is designed using PHP , Postgre SQL is used for database and Apache server is used for application server. Reports are generated using plain HTML as well as PDF format. GIS maps are also used which dynamically show the rainfall.

The system uses a Virtual Mobile Number (VMN) for collecting the data. All Circle level officers send the rainfall SMS to this number, which stores this data on the SMS gateway server. On the website, only the application server has a public IP, while the Database server has a private IP. Thus, the database is not exposed and it is available via reports and graphs.

#### (ii) Interoperability

Data from this website can be shared with other application of different departments. Already, the data is shared as a web service with State Data Bank project of Planning Department and MRSAC (Maharashtra Remote Sensing Application Centre)

#### (iii) Security concerns: None

#### (iv) Any issue with the technology used: None

#### (v) Service level Agreements(SLAs) (Give details about presence of SLA, whether documented, whether referred etc. #)

Internally, the data collection has to happen on a daily basis and this is monitored with each circle level officer responsible for data collection

### 6. **Citizen Centricity** (Give specific details on the following#)

#### (i) Impact on effort, time and cost incurred by user,

- Data is easily available in public domain for all citizens, farmers, students, researchers for use, without any cost
- GIS maps can be generated instantaneously which show the rainfall by rendering Circle (village) level boundaries

(ii) Feedback/grievance redressal mechanism: This application is an information system and does not provide any transactional service as such. Hence a feedback mechanism is yet to be implemented

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(iii) Audit Trails: Not applicable

(iv) Interactive platform for service delivery: The maha rain website is the interactive platform which gives detailed rainfall information and maps

(v) Stakeholder consultation:

The project was initiated by Agriculture department in order to gather and analyze rainfall data and make it available for decision making. Support and Guidance was provided by the Chief Secretary and the Chief Minister of the State. Key stakeholders who were consulted include Agriculture department, Revenue department, District Collectors, Revenue officers and Statistics section of Agriculture department

### **7. Demonstrate Innovation in use of Mobile Technology for e-governance**

(Give details about the mobile technology used (platforms, SMS, Pull & Push, Apps, Mobile Payment,), innovation applied in use of mobile technology to deliver information or Services to target audience #)

Rainfall is collected using PUSH SMS, where in Circle level officers collect the rainfall data by sending the SMS to a Virtual Mobile Number. They received an acknowledgement and also received alerts if the message format is incorrect.

Data sent over SMS is stored on the server. On the website, only the application server has a public IP, while the Database server has a private IP. Thus, the database is not exposed and it is available via reports and graphs.

### **8. Adaptability and Scalability** (Give details about Local language support, ability to leverage shared Government infrastructure, Standardization of technology used (hardware, software, application etc. #)

The system can be scaled up to include more rain gauge stations if required. It can be adapted in any other type of project where in mobile based data collection is necessary

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### 9. **Adaptability Analysis**

#### (i) Measures to ensure adaptability and scalability

The system uses open source standards to ensure adaptability and scalability.

GIS maps were designed By NIC without using any proprietary GIS package.. The data was displayed on the maps, from Circle level boundaries, using computer programming. Based on the coordinates of a particular Circle on the map, the program displayed the rainfall in that particular circle, colour coding the area as per the rainfall intensity.

#### (ii) Measures to ensure replicability

The project is easily replicable in other States or in similar projects where in mobiles can be used for data collection. (e.g. for Health Department, if village wise health survey is to be done, this project can be adapted to collected data and analyze it and use GIS maps to display it. This could be survey of diseases, status of vaccinations etc)

#### (iii) Restrictions, if any, in replication and or scalability: None

#### (iv)

#### (v) Risk Analysis: The portal has been security audited to take care of web based threats to the database and application. Departmental login is secured with user ID and password

10. **New Models of Service Delivery** (Give details about type of partnership model used, Links to/Supported by Public/Private Organization, Links provided to relevant websites etc. #)

The rainfall data can be shared with interested parties via web service. As stated earlier, it is already shared as a web service with State Data Bank project of Planning Department and MRSAC (Maharashtra Remote Sensing Application Centre)

### 11. **Efficiency Enhancement** (Give specific details about the following #)

#### (i) Volume of transactions processed,

Every day, rainfall data from 2065 circles is collected on the maha rain website

#### (ii) Coping with transaction volume growth



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The servers are capable of handling increased transactions. However, the daily transaction may not change much since the number of rain gauge stations as of now is fixed.

(iii) Time taken to process transactions: Instantaneous

(iv) Accuracy of output:

Accurate Circle level maps are available for rendering the rainfall data.

Also, data correction check is carried out at District level to correct any erroneous data

(v) Number of delays in service delivery: None

12. **User convenience** (Give specific details about the followings #)

(i) Service delivery channels (Web, email, SMS etc.)

For data collection: Mobile (SMS)

For data dissemination: Web

(ii) Completeness of information provided to the users: Complete data sets are available online

(iii) Accessibility (Time Window): Accessible 24X7

(iv) Distance required to travel to Access Points:

Circle officers need to travel only to the rain gauges in their circles to collect data. The end user does not need to travel at all since data is available online

(v) Facility for online/offline download and online submission of forms: Not applicable

(vi) Status tracking: Not applicable

13. **Sustainability** (Give details about sustainability w.r.t. technology (technology used, user privacy, security of information shared – Digital Encryption etc. #), Organization (hiring trained staff, training etc. #), financial (Scope for revenue generation etc. #)

- Successful 100 % recording from all Circles has been achieved, making the project self sustainable
- Monitoring of rain recording on daily basis
- Training to circle officers is planned before the start of monsoon, to refresh the knowledge of existing users and to provide training to new officers
- Verification of data and corrections in case of errors

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- Application is developed using scalable open source technology, independent of licensing issues/fees

The project is running successfully over a year

14. **Result Achieved/ Value Delivered** to the beneficiary of the project-(share the results, matrices, key learning's, feedback and stakeholders statements that show a positive difference is being made etc):

**(i) To organization**

- Speedy data collection
- Ability to monitor the mobiles and automatic SMS on receipt of data and also regarding incorrect SMS

**(ii) To citizen**

- Real time as well as historic rainfall data and maps available on the website

**(iii) Other stakeholders**

Agriculture Inputs industry, researchers, students, other governmental organizations can use the data as required

15. Extent to which the Objective of the Project is fulfilled-(benefit to the target audience i.e.G2G, G2C, G2B, G2E or any other, size and category of population/stakeholder benefited etc):

Main benefit of the project is in terms of G2C, wherein accurate rainfall data is available free for use. Also, internal efficiency is increased due to speedy data collection and dissemination (G2G)

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16. Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benefit, change in legal system, rules and regulations

- Rainfall data was earlier collected at Taluka level only. Data was collected manually (no SMS) and collated at District level. It was then fed into the software at district level. This process took anywhere between 2-7 days.

In the present system, the data is available in the software as soon as it is captured and sent over SMS. Daily rainfall is collected this way and is available by 11 am for analysis and decision making. Thus, the delay faced in the earlier system between data collection and data availability is no longer an issue. Efficient and quick decision making is possible (such as detection of flood or drought situation, deficit rainfall etc) since data is available in real time at all levels of the government.

- Another key difference is the capturing of Circle level rainfall, which was earlier estimated based on the Block level rainfall; this often resulted in incorrect depiction of rainfall at circle/village levels.

In the present system, the data is captured at circle levels and it is even analyzed and rendered on maps by showing circle boundaries. Thus, the status of rainfall (normal/deficit/excess) from Circle level upwards is available in near real time. This ground up approach of data collection has ensured accurate representation of actual rainfall data in the State.

16. Other features of the project:

- This is a unique project (as regards the use of mobiles as well as Circle (village) level rain gauge stations) which is implemented for the first time in the country in Maharashtra State.