Case Study

GARV application- initiative under UE Mission- a Project Monitoring mechanism to monitor milestone based progress

URL- https://garv.gov.in/garv2/dashboard/garv

<div align="center">

<u>INDEX</u>

</div>

1. EXECUTIVE SUMMARY

On 15th August 2015, the Prime Minister announced that all unelectrified (UE) villages would be electrified within 1000 days, following which the Ministry of Power has taken up the electrification of all 18452 UE villages on Mission mode. However, these remaining 18,452 UE Villages are located in highly inaccessible areas (thick forested, mountainous regions, etc.), areas with tough terrain, extreme temperatures, areas facing Right of Way (ROW) issues, or areas plagued by insurgency and extremism. Keeping in view these challenges and pace of electrification of villages during last few years, it would have taken nearly 10 years to electrify the remaining villages. A new monitoring mechanism was set up to get regular progress of each village.

Young electrical engineers; Gram Vidyut Abhiyanta (GVA) was appointed at block/district level. In order to shoulder this mission and accelerate its pace, GARV app, well acknowledged for its transparent and accountable mechanism was designed and brought into development. The App was launched by Power Minister on 14th Oct, 2015. The GARV APP is designed in such a manner that it is able to delicately monitor and scrutinize the progress of electrification status of all the 18452 UnElectrified villages through an online system. The new monitoring mechanism helps in improving pace of village electrification.

Due to this, during the year 2015-16, 7108 villages were electrified and as on 31st of August, the achievement has crossed 10,111 UE villages. Key consideration for nominating the project: The project monitoring methodology adopted for UE mission in the form of GARV App is unique example of E-Governance as it enables, participation of general public in monitoring a government program and makes the administration transparent and accountable to accomplish the target in given timeframe.

2.   INTRODUCTION

Under UE mission, all 18452 villages spread across 19 States of the country are to be electrified. To meet the ultimate goal of electrification of these villages in time bound manner, a comprehensive project monitoring mechanism has been developed. This unique monitoring mechanism "GARV" leverages the mobile technology and empowers all stakeholders, viz. Central Government, State Governments, Distribution Companies and general public at large. The interactive dashboard of the GARV App provides complete information on status of electrification works in these 18452 villages in highly transparent manner. The dashboard is powered by the data captured by a team of 370+ trained Graduate Engineers called Gram Vidyut Abhiyanta (GVA) who visit these villages on regular basis to monitor the progress of works in terms of milestones achieved supported by photographs. The UE mission is benefitting from reach of Information & Communication Technology thereby enabling mass public participation through GARV App which has brought transparency in implementation of a government program and has made the agencies involved accountable for the progress being made. The UE mission has empowered the general public as the services are being disseminated in the form of real time information through a mobile app. The "GARV" mobile app is freely downloadable for all three major platforms, viz. Android, iOS and Windows. GARV dashboard can also be accessed in the form of web portal (http://garv.gov.in).

The mission has impact on the lives of approximately 1.5 crore people (as per 2011 census) residing in these 18452 villages and strengthens the faith of general public in the implementation of this Government program.

3.   OVERVIEW OF THE CHAMPION

Dr. Dinesh Arora, working as Executive Director, Rural Electrification Corporation (REC) and CEO RECPDCL, a subsidiary of REC Ltd., having experience in project execution & operations, an extensive board level experience in developing ground-breaking strategies especially, in the top echelon of public healthcare sector, heads the Project Monitoring Group handling the Rural Electrification initiatives of Government of India which includes the flagship program of the Government "Deen Dayal Upadhyay Gram Jyoti Yojana". He has played an instrumental role in formulating the 'Garv App' and also setting up of institutional mechanism of Gram Vidyut Abhiyanta to accelerate the implementation of Rural Electrification projects in 18452 un-electrified villages of the country. The Garv app is a complete project monitoring mechanism, which ensures transparency and accountability.

Recently, the GARV App has been awarded the prestigious Digital India Award-2016 for Best Mobile App by Ministry of Electronics & IT, Govt. of India, National e-Governance Award-2016 "GOLD" by DARPG, Govt. of India and Indian Express Editor's Choice Award for the year 2016 at the Technology Sabha, an initiative of Indian Express Group.

4.   PROJECT OVERVIEW/HISTORY OF THE PROJECT

At the time of independence, only 3,060 villages had electricity and hence, there was continuous emphasis on village electrification. Indian rural electrification programme passed through several stages. Despite many programmes of Govt. of India, as on 1st April 2015, 18,452 villages were still left for electrification which are mainly located in Odisha (3,428), Assam (2,892), Bihar (2,747), Jharkhand (2,581), Arunachal Pradesh (1,578), Meghalaya (912), etc. Govt of India launched Deendayal Upadhyaya Gram Jyoti Yojana in December 2014. It focuses on multiple aspects, which are - Separation of agriculture and non-agricultural feeders, strengthening of sub transmission and distribution system including metering at distribution transformers/feeders/consumers and it subsumes components of all previous ongoing Rural Electrification schemes.

Bottlenecks-

- To electrify 18,452 villages in 1,000 days, i.e. to maintain the pace of 19 villages per day.
- Setting up of a transparent and an accountable system within such a deep-rooted, complex and extensive project.
- Replacing the earlier process, i.e. progress reporting system through papers.
- The high inaccessibility of the target areas due to bumpy hilly terrains, densely forested areas, areas charged of left wing extremism etc.
- Unprecedented challenges which could not be predicted such as Right of Way (ROW), railway clearances, forest clearances etc, causing delays.

5.   SITUATION IN CHAMPION's STATE/DISTRICT

5.1   **Beneficiaries-** The UE mission empowers all its stakeholders, viz. Central Government, State Governments, Distribution Companies and general public at large through its innovative project monitoring mechanism: GARV App. GARV is an app for the people who ensure highest level of transparency and accountability in implementation of rural electrification programme of Govt. of India. The UE mission aims to make electricity available in remaining 18452 un-electrified villages in the country with minimum delay. These villages have always remained in dark and even after 69 years of independence, people in these villages are leading life of misery. The impact of basic amenity 'electricity' on all the developmental aspects of life, viz. standard of living, education, healthcare, agriculture, small scale industries & employment opportunities is becoming visible. The people residing in these villages are seeing the arrival of electricity in their villages as a ray of hope for a better present and bright future. They are actively participating in the program and are facilitating solutions to local issues faced during execution of works.

5.2   **Problems identified:** REC had been facing difficulty in monitoring electrification process of villages. The pace of electrification was very slow as only 2,587 villages were electrified during 2012-13, 1197 villages during 2013-14 and only 1,405 during

2014-15. The remaining unelectrified villages are in hilly or difficult terrains, naxal affected areas and remote deserts. The actual number of unelectrified villages was not known and it was difficult to identify whether a particular village has been declared electrified and whether fund for electrification has been sanctioned for the correct village. The State distribution companies were executing as well as reporting agencies and the villages being in remote areas, their electrification is considered economically non-viable venture.

5.3   Strategy Adopted-

5.3.1 <u>Details of base line study done:</u> Rural Electrification Corporation being the nodal agency for rural electrification programs of Central Government in the country has been playing an important role in implementation of various rural electrification schemes. The company has rich experience regarding the technical, financial and implementation aspects of establishing distribution infrastructure in rural areas.

5.3.2 <u>Roll out/implementation model:</u> The inspiration for UE mission was derived from the Swachh Vidyalaya Abhiyan under which Rural Electrification Corporation had successfully built 13,000 toilets within given time lines. The quality and pace of work was ensured by milestone based independent monitoring through extensive field visits by trained civil engineers supported by photographs of each stage/ milestone of the work. A full-fledged project monitoring mechanism has been developed in the form of GARV App for all levels of administration and public at large with 100% transparency and accountability to track status of electrification works in remaining UE villages. The entire electrification process has been objectively divided into 12 milestones. To enable GARV App, young electrical engineers called 'Gram Vidyut Abhiyantas' (GVA) have been deployed to help in monitoring status of works in these 18,452 villages. The GVAs have been provided Android based tablets with GARV App installed. They visit individual villages and update milestone based progress of works being executed in these villages along with photographs of site. A record of visits is maintained along with visit wise status of milestone based progress along with photographs. Reasons for delay in execution of works can also be recorded for each village and delayed villages are highlighted on dashboard for speedy action and early resolution.

5.3.3 <u>Communication   and   dissemination   strategy   and   approach   used:</u> The communications regarding the mission and instructions to GVAs are given through official channels. But to connect with ground level team, informal channels like WhatsApp groups are extensively used where GVAs can highlight the concerns and get guidance from the seniors. Executive Director, Dr. Dinesh Arora is available actively on these state wise WhatsApp groups to help and guide the GVAs. Training programs were conducted in different regions to train the manpower regarding use of this new technical solution. The focus was given on "Train the Trainer Concept" so that the GVAs at State level can train their juniors at district level.

File size & Download Links for Different Platforms
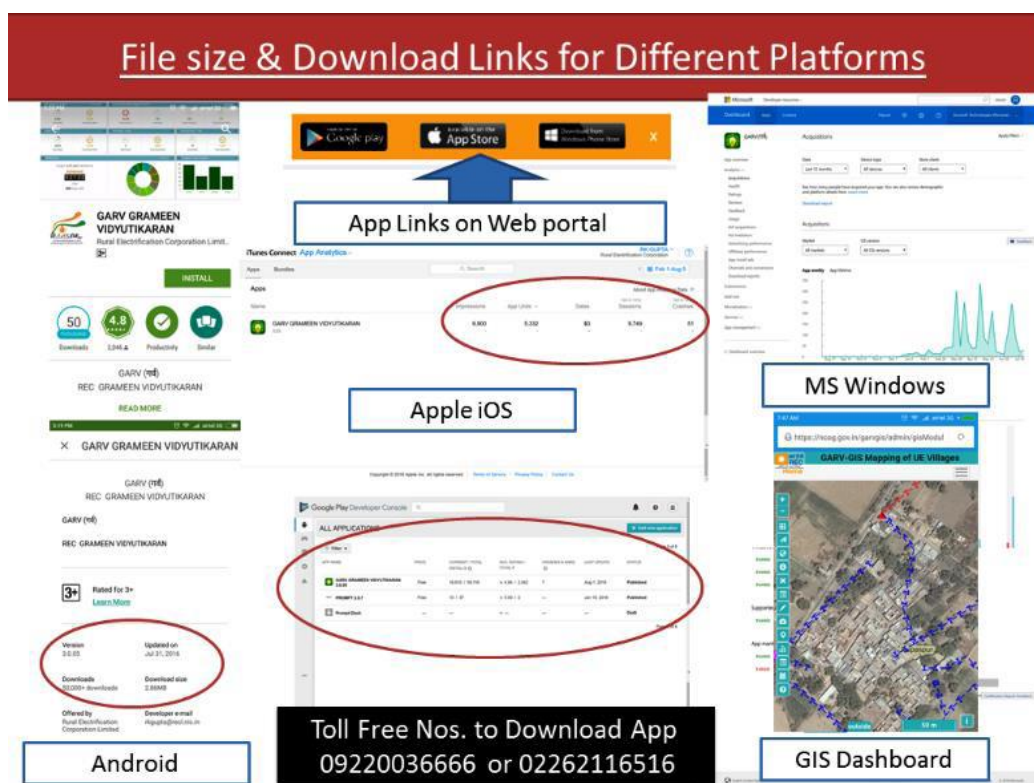
GARV App is available on all major platforms, viz. Android, Apple iOS and Windows. The App is freely downloadable and has registered more than 59,000 downloads on Android platform and approximately 5300 downloads on Apple iOS platform. The GARV App can also be downloaded by giving a missed call on the Toll free number: 09220036666. Apart from GARV app, the UE mission is active on Twitter and Facebook to reach out to general public and increase public participation. The mission has 1,42,141 likes on Facebook (www.facebook.com/grameenvidyutikaran) and 4,662 followers on Twitter (www.twitter.com/grameenvidyut) with 1,230 tweets till date.

6   MODALITIES OF THE NEW SYSTEM (SOLUTION)

6.1   Components of the GARV App:

6.1.1 The Dashboard: The dashboard shows the entire information about various stages of electrification of 18,452 villages covered under the mission. It shows the status of electrified villages, to be electrified villages, etc. on real time basis at state, district and village level. The information is represented on dashboard in different categories, viz. milestone based progress, weekly progress, progress in grid & off-grid villages and under different plans. The dashboard also provides GVA's contract details to make the reporting process transparent and making them accountable for their visit reports.

6.1.2 GVA Screens: GVAs upload milestone wise progress of a village during their visit to the villages. This also comprises of details of existing and new infrastructure, photographs of the landmarks and work in progress.

6.1.3 <u>GIS/Asset Mapping:</u> It provides the ground level view of location of every village/district and its assets {viz. the DT (Distribution Transformer), Low-tension (LT) Line, and High-tension (HT) line, etc.}, which facilitates further analysis and decision making.

6.1.4 <u>Village Adoption:</u> This interesting feature empowers the user to choose one or more than one State/District or Villages of their choice and get regular updates regarding progress of works in chosen villages.

6.1.5 <u>Multilingual:</u> GARV App is multilingual to make the app understandable and easy to the general public.

6.1.6 <u>Social Media integration:</u> Social media tools like Facebook, Twitter, YouTube and Instagram have been integrated to create awareness among people in order to increase the transparency.

6.1.7 <u>Feedback Mechanism:</u> To ensure a two way flow of communication, we have feedback and suggestion feature to ensure our stakeholders including general public to provide valuable feedback. The emails thus received are responded to in timely manner and necessary action is also ensured.

6.2   Technology Platform used-

6.2.1 <u>Description-</u> The entire project is utilising Open Source technologies, viz.: the web interface has been developed using PHP and the database is maintained in MySQL with hosting on Apache web server. The GARV App is available on Android, iOS and Windows platforms. The feature for GIS mapping of village level distribution infrastructure has been developed by BISAG, Govt. of Gujarat, in association with MeitY, Govt. of India. The GIS application and database is hosted on NIC cloud. For GVAs, login based data entry screens are provided. The App functions in both online and offline mode. Offline mode caters to capturing data in remote villages where mobile network is not available. Once the GVA returns to the network coverage area, the mobile app synchronizes with the server and data is updated. Web interface provides the facility to generate MIS reports. The web interface also provides features for user management of GVAs, admin user profile for master data maintenance, approval screens for Regional Office and Head Office level approvals of the visit reports submitted by GVAs.

6.2.2 <u>Interoperability-</u> The software supports interoperability and data can be exchanged on different platforms. The data can be exported to excel files for further usage.

6.2.3 <u>Security Concerns-</u> The software is secure and a security audit was conducted and various vulnerabilities identified during the audit have been fixed and security certificate in this regard has been obtained.

6.2.4 <u>Service Level Agreements (SLAs)-</u> Service Level is governed by the terms and conditions of Letter of Award of work.

Certificate (Left)

AKS IT SERVICES
AKS Information Technology Services Private Ltd.
E-52, Sector-3, NOIDA-201301
Fax: +91-120 4243669   Mobile: 91 9811943669
E-mail: info@aksitservices.co.in Website: www.aksitservices.co.in
An ISO 9001:2008& ISO 27001:2013 Certified Company

Certificate

Application Name:	GARV
Application Platform:	Android
Audit Performed by:	Rahul Yadav
Testing Date:	14 July 2016 – 21 July 2016
Conclusion:	Mobile Application was tested & free from OWASP (any other known) vulnerabilities and is safe for hosting.

Recommendations:-

1. Server Hardening need to be in place for the production server.

Note: The certificate is valid till no additional changes in the dynamic content carried out or one year from the date of issue whichever is earlier.

(Ashish Kumar Saxena)
M Tech, CISSP, CISA, FIETE, MBCI
Managing Director
AKS Information Technology Services Pvt. Ltd
Govt. of India, CERT-In Empanelled Company
Date of Issue:
25th July 2016
Certificate No: AKSIT/2016-17/108

Certificate (Right)

AKS IT SERVICES
AKS Information Technology Services Private Ltd.
E-52, Sector-3, NOIDA-201301
Fax: +91-120 4243669   Mobile: 91 9811943669
E-mail: info@aksitservices.co.in Website: www.aksitservices.co.in
An ISO 9001:2008& ISO 27001:2013 Certified Company

Certificate

Application Name:	GARV
Testing URL:	http://prompt.southeastasia.cloudapp.azure.com/garvtest/
Production URL:	http://garv.gov.in/
Audit Performed by:	Rahul Yadav & Ravi Ranjan
Testing Date:	10 May 2016 – 16 July 2016
Conclusion:	Application is free from OWASP (any other known) vulnerabilities and is safe for hosting.

Recommendations:-

1. Application may be considered safe for hosting with Read Only permission:

   Yes

2. SSL Deployment is suggested on production server for further enhancing security.

   Authentication mechanism is being used in the given website at the following URL:

   http://prompt.southeastasia.cloudapp.azure.com/garvtest/auth/login

3. Write permission should be granted only on the folder where the files are to be Uploaded given at the following URL:

   http://prompt.southeastasia.cloudapp.azure.com/garvtest/assets/uploads

4. Web Server and OS Level hardening need to be in place for the production server.

Note: The certificate is valid till no additional changes in the dynamic content carried out or one year from the date of issue whichever is earlier.

(Ashish Kumar Saxena)
M Tech, CISSP, CISA, FIETE, MBCI
Managing Director
AKS Information Technology Services Pvt. Ltd
Govt. of India, CERT-In Empanelled Company
Date of Issue:
18th July 2016
Certificate No: AKSIT/2016-17/99

6.3   Citizen Centricity

6.3.1 <u>Impact on effort, time and cost incurred by user:</u> The UE mission empowers all their stakeholders through the GARV App. GARV is an app for the people. Apart from its interactive dashboard, the App provides a user to digitally adopt villages of his/ her choice to track the progress of works. The user can digitally adopt a particular village or a group of villages in one or more States or districts. The digital adoption is performed through a simple registration process which does not involve any financial implication. The name, email and mobile no. along with villages to be adopted are captured by the app at the time of registration. This user information is retained by the app and the user can access a personalized dashboard with only selected states or districts or specific villages. The registered users are regularly intimated through push notifications regarding the progress of work in their villages of interest covered under UE Mission. Such users are also intimated about the activities in Gram Vidyutikaran Mission through fortnightly newsletter. The app is freely downloadable and the services are available free of cost.

6.3.2 <u>Grievance mechanism:</u> The GARV App has been developed as monitoring and informative tool for people with varied interests regarding rural electrification. It is an App for the people to participate in the development of those parts of country which have been left far behind by tracking the status of works and to expedite the process through micromanagement at various levels. The App is supported by a dedicated social media team who are interacting with users through Twitter, Facebook and emails. The 500+ social media interactions comprising of feedbacks, queries and grievances received have been addressed and best possible solution has been provided. The transparency provided

by App has increased public participation through social media which in turn has increased accountability. One example is of village Khajuan of Bihar. A resident of village, Sh. Sachidanand took up task to expedite electrification in his village and facilitated resolution of issue of Right of Way being faced by the executing agency.

6.3.3 <u>Audit Trails:</u> The data entry portion of the GARV App which is role of GVA or the users at regional and head office, is governed by secure authentication mechanism and logs are maintained to track the source of data or updations in the system.

6.3.4 <u>Interactive platform for service delivery:</u> The information under UE mission is available on GARV dashboard with following salient features:

- Dashboard with milestone based monitoring of electrification works in unelectrified villages segregated as Electrified, Under Progress & To Be Electrified.
- It provides pan India view with option to drill down to State, District and village level.
- Visit wise status of works is displayed along with photographs and reason for delay, if any.
- Displays data regarding distribution infrastructure created and households connected in a village.
- Contact details of GVAs are displayed to make them accessible and accountable for integrity of data being captured.
- GIS mapping to facilitate decision making during survey and execution.
- Facility for feedback and suggestions along with active social media presence.
- Village adaptablity for customized tracking information for specific State/district or village on personalized dashboard & daily progress notifications.

6.3.5 <u>Stakeholder consultation:</u> The information is available to all the stakeholders in a transparent manner and the data pertaining to the electrification status of villages is displayed on the GARV dashboard with the consent of State Distribution companies, who, being the executing agencies are actual custodians of the data.

6.4 Innovation

The earlier system involved providing electrification progress data in terms of number of villages electrified during the month by State Distribution Companies, which had high possibility of errors.

The implementation of new project monitoring system in the form of GARV App was done to overcome all the weaknesses of the earlier system in terms of use of technology, milestone based reporting, deploying trained manpower, transparency, teamwork and involvement of all stakeholders to achieve the ultimate goal well ahead of given timeline.

6.4.1 Gram Vidyut Abhiyantas (GVAs): More than 350 young electrical engineers have been trained and deployed in these 18,452 villages for regular visits to these villages to independently capture the progress of electrification works in the GARV App along with reason for delay if any.

6.4.2 Roles & Responsibilities of GVAs: Visiting villages on a regular basis, capturing the milestone-wise progress including photographs of works, Updating the progress on GARV app, Coordinating with DISCOM officials, District Administration and REC.

6.4.3 Technology: The latest mobile technologies have been used to develop project monitoring system in the form of GARV App. The GVAs have been provided with Tablets to capture the milestone based status of electrification work along with photographs. It enables: Real-time dashboard, paper-less working, capturing village-wise milestones, Uploading photographs/GPS coordinates, timely highlighting of implementation hurdles if any, Habitation-wise infrastructure allows offline data entry.

6.4.4 Milestone based reporting: The entire process of village electrification has been divided into 12 milestones to objectively monitor the progress of works. During his visit to the village, the GVA captures the progress of works in the form of 12 predefined milestones. This enables the Management to know where exactly the work is getting delayed and which agency is responsible for that. Based upon this input, the necessary action is taken to ensure the timely completion of works.
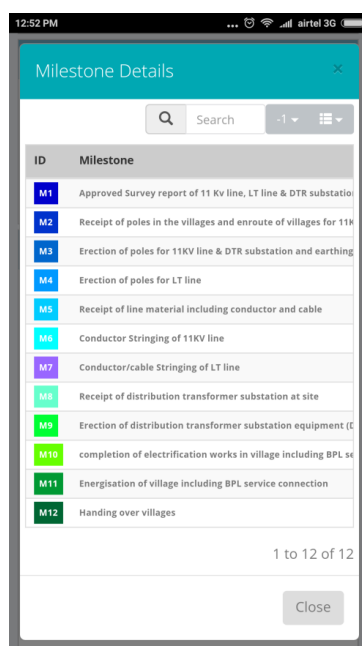
With this approach of micro-management the time required for electrification of villages has been drastically reduced and for one of the village, Anandpur, the work was completed in only 5 Days.

6.4.5 Secure System Design: The application, though, publicly available in the form of informative dashboard utilises secure MD5 algorithms for user authentication for screens used by the GVAs for capturing visit data and the regional offices and head offices for necessary approvals.

6.4.6 Backup & Disaster Recovery: Robust backup and recovery procedures have been put in place to meet any sort of emergencies.

- Weekly full backups and daily incremental backups have been scheduled for application and database
- Last three full back ups are retained to meet the disaster situation

6.5 Adaptability Analysis

The GARV App developed for UE mission has been designed to ensure adaptability and scalability:

6.5.1 Adaptability: The user can customize the dashboard as per his or her interests. Apart from look and feel of the dashboard, the choice of data to be displayed has been provided in the hands of user. A feature called village adaptability has been provided which facilitates user to digitally adopt a particular village or a group of villages in one or more states or districts. The digital adoption is performed through a simple registration process which does not involve any financial implication. The name, email and mobile no. along with villages to be adopted are captured by the app at the time of registration. This user information is retained by the app and the user can access a personalized dashboard with

only selected States or districts or specific villages. The registered users are also regularly intimated through push notifications regarding the progress of work in their villages of interest covered under UE mission.
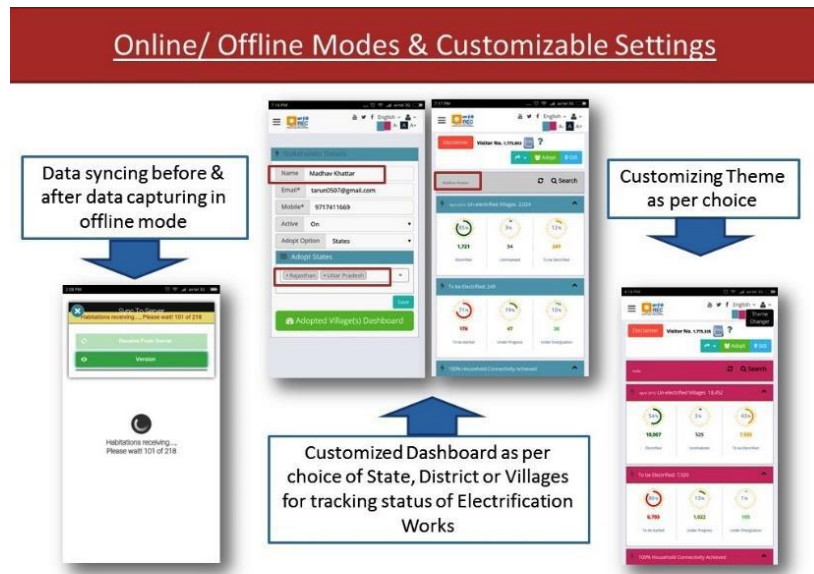
6.5.2 <u>Scalability:</u> The modular structure of the dashboard and the database enables the development and addition of further details. It may be noted that the application has evolved over a period of time with the feedback from different stakeholders, to bring in maximum transparency. It may be noted that the UE mission is soon moving towards its next step which aims at 100% household electrification covering all 6 lakh villages of the country which will involve data regarding availability of electricity in the households in these villages.

6.5.3 <u>Measures to replicate the system:</u> The system has been designed as a generalized project monitoring mechanism based on real time capturing of progress in very objectively defined milestones. This model can be replicated and customized to suit similar requirements of project monitoring and over a period of time, it has been experienced that such mechanisms are the need of the hour for most of the Government programmes for their speedy implementation to ensure maximum transparency and accountability. REC has received such queries from different State Governments and Central Government Ministries to replicate similar system in their domain.

6.5.4 <u>Restrictions in replication and or scalability:</u> There is no restriction in replication and scalability either technically or in terms of design as the system has been developed using Open source technologies which do not restrict any amount of customization or expansion.

6.5.5 <u>Risk Analysis:</u> The risks involved and the vulnerabilities have been assessed and a proper backup and recovery policy has been put in place to meet any sort of emergency situations. A security audit was also got conducted for the application from certified agency and the vulnerabilities pointed out have been fixed.

6.6 User Convenience

The information of UE mission is available both on web as well as in the form of mobile app which is available in three major platforms (Android, iOS and Windows). The information regarding UE mission is also available on Facebook and Twitter. The videos captured by Gram Vidyut Abhiyantas covering feedback of villagers have been made available on a dedicated channel for Grameen Vidyutikaran on YouTube. Apart from this, the registered users daily receive progress alert messages in the form of push notifications.

6.6.1 Completeness of information provided to the users: To ensure the completeness and integrity of data, the GVAs have been made accountable and actual data has been published in the public domain. To handle any wrong reporting, the data from a village is collected by GVAs on rotation basis and it is also authenticated by the regional office and head office teams.

6.6.2 Accessibility (Time Window): The information is available online 24 x 7 without any restriction.

6.6.3 Distance required to travel to Access Points: The service provided by UE mission using latest internet and mobile technologies is available in the form of information that can be accessed from a computer or smart phone with internet access from anywhere.

6.6.4 Facility for online/offline download and online submission of forms: The online and offline mode for data capturing are available for field engineers (Gram Vidyut Abhiyantas).

6.6.5 Status tracking: The complete status of the UE mission can be tracked from the GARV dashboard by all the stakeholders.

6.7 Outcomes

6.7.1 Defined Outcomes:

- To electrify all remaining UE Villages on mission mode within the given timeframe.
- To bring in accountability and transparency through dissemination of information to general public at large and creating awareness.
- To speedily implement the electrification works through micro management, involving all stakeholders – Ministry of Power, State Governments, State DISCOMs, District administration and general public.
- To facilitate better decision-making, with regular field-level updates of milestone-based progress by the Gram Vidyut Abhiyanta (GVA) which are reflected in real-time on the Dashboard.

6.7.2 Outcomes Achieved:

- Effective project monitoring involving all levels of administration.

- Provide real time information of status of electrification works.
- Faster execution by resolution of issues reported by GVAs through App.
- Dissemination of information to general public brings in transparency and accountability.
- GIS Mapping of distribution infrastructure facilitates decision making.

6.8   Comparative Analysis of Earlier Vs New System:

1.   The benefits post-deployment can be seen from the comparison of progress in electrification over the last 4 years with progress made last year and in 2015-16, as shown below:

2. The deployment of the GARV mobile app has allowed for viewing the status of electrification at national, State, district and village levels on a single platform. This has reduced time and effort in collecting and verifying data from various sources for monitoring purposes, as was done before deployment.

3. Milestones designed for both Grid and Off-grid projects are clearly defined and provide a better way to track progress of electrification. Taking pictures of milestones ensures more prompt work by contractors and greater attention to quality of requisite works.

4. The collection of village-level visit data by Gram Vidyut Abhiyantas (GVAs) has led to close monitoring at an unprecedented level, instead of relying on data provided by state utilities alone.

7   IMPACT ON THE STAKEHOLDERS/BENEFICIARIES

7.1   To organization

Rural Electrification Corporation is the nodal agency of Government of India for rural electrification. The Electrification of all Un-Electrified villages has been taken up under Deendayal Upadhyaya Gram Jyoti Yojana/State plan/Renewable etc. The rural electrification projects sanctioned by the Ministry of Power under the scheme for various States are implemented by the concerned DISCOMs/Power Departments of the States/Renewable agencies, CPSUs, etc. Efficient and effective field level monitoring plays a significant role in ensuring electrification of remaining un-electrified villages within a given timeframe with requisite quality of works. Ministry of Power entrusted the works of monitoring of UE villages to REC. Keeping in view the challenges for electrification of these remaining unelectrified villages located in difficult terrains, inaccessible/ Naxal affected areas and lack of will on part of state distribution companies, REC devised this

innovative monitoring mechanism and is successfully achieving the mission objective with maximum transparency.

7.2   To citizens

The UE mission aims to make electricity available in remaining 18,452 un-electrified villages in the country with minimum delay. These villages have always remained in dark & even after 69 years of independence, people in these villages are leading life of misery. The impact of basic amenity "Electricity" on all the developmental aspects of life, viz. standard of living, education, healthcare, agriculture, small scale industries & employment opportunities is becoming visible. The people residing in these villages are seeing the arrival of electricity in their villages as a ray of hope for a better present and bright future. They are actively participating in the program and are facilitating solutions to local issues faced during execution of works.


7.3   Other stakeholders

All the key stake holders, viz. Central Governments, State Governments, district administrations, state distribution companies, executing agencies and the general public are being benefitted from the success of the UE mission. The transparency and accountability being provided by the mission has sensitized the entire Government mechanism to ensure timely delivery of quality works in these villages. The status is being monitored at all levels and one can pin point the pace of progress and the reason for delay, if any.

Ultimately this approach has evolved itself as complete project monitoring for all the stakeholders and empowers them to take its benefits in their desired ways. A letter from CMD, Bihar State Power (Holding) Co. Ltd. to CMD, REC with a request for continuing the support of GVAs and GARV methodology for Intensive Electrification works in the State

even after completion of works in un-electrified villages is great appreciation for the UE mission. A copy of the letter has been attached.
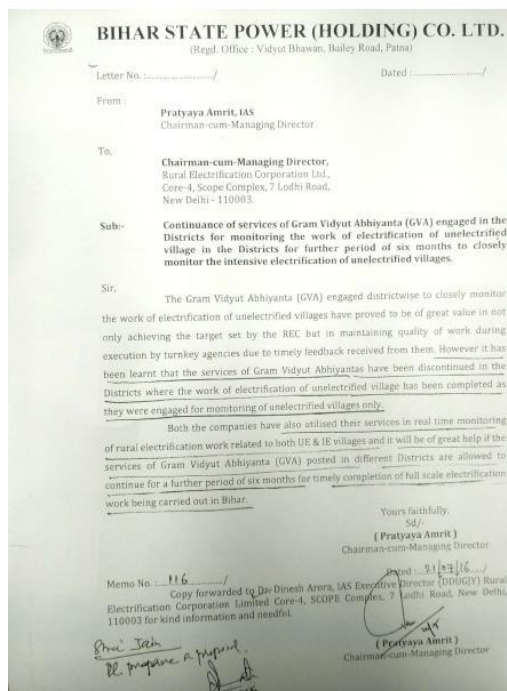
8   FUTURE ROADMAP/SUSTAINABILITY

Highlighting the sustainability aspects of the UE mission it is stated that:
UE mission is the part of Deen Dayal Upadhyay Gram Jyoti Yojana (DDUGJY) which is flagship program of Government of India covering various aspects of rural electrification, viz. UE mission (i.e. electrifying the remaining unelectrified villages), rural household electrification, system strengthening, agricultural feeder segregation, metering and Sansad Adarsh Gram Yojana (SAGY). Government of India is determined to achieve the goals of Deen Dayal Upadhyay Gram Jyoti Yojana with the active involvement of State Governments. The UE mission being a priority initiative of the Prime Minister is being monitored at highest level of administration and GARV App has proved to be an efficient tool for same. The project monitoring methodology adopted for UE mission in the form of GARV App is unique example of e-Governance as it enables, participation of general public in monitoring a government program and makes the administration transparent and accountable to accomplish the target in given timeframe. With such a focussed approach, the UE mission has achieved electrification of 7,108 villages during year 2015-16 against the set target electrification of 5,686 villages. With this pace, we plan to achieve electrification of all the remaining villages by March 2017 well ahead of target.

Apart from this the UE mission is also working on a Digital Inclusion Approach:

During the UE mission, our GVAs, apart from capturing the progress of electrification works also interact with the villagers and make them aware regarding the welfare

programs like free BPL connections being provided by the Government. The villagers share their experiences and are very optimistic about their future after electricity has been made available in these villages. They are looking forward for a better life and bright future for their children. The electrification of villages will pave the way to realise the bigger dream of Digital India where all the information and education facilities could be made available even in remotest corners of the country.

The Road Ahead:

The Central Government has also targeted to provide 24×7 Power for All by March 2019 which will include 100% household connectivity in both rural and urban areas. Keeping this in view the work has started to extend scope of GARV App to cater to requirements for intensive electrification in all the 6 lakh villages of the country.

<><><><><>

9. <u>Teaching Notes</u>

GARV application- initiative under UE Mission- a Project Monitoring mechanism to monitor milestone based progress

1.   <u>OVERVIEW</u>

Rural Electrification Corporation has used the latest mobile and web technologies to develop a mobile application for monitoring of progress of electrification works in the remaining 18,452 unelectrified villages of the country which are in the remotest and toughest areas of the country.

GARV application developed under UE mission, by REC, is a project monitoring mechanism to monitor milestone based progress. It is the only App which provides such objective monitoring of works on the dashboard with clear indication of status of electrification works in individual villages. Earlier, manual methods were used to track the progress of electrification works only in terms of number of villages but GARV App tracks every single village with its unique census code, status and landmark photographs. The GVAs have been provided with Tablets to capture the status of electrification work along with photographs.

GARV App is available on all major platforms, viz. Android, Apple iOS and Windows. The link can to be also be downloaded by dialling toll free number 0220036666. The App is freely downloadable and has registered more than 72,000 downloads.

For GVAs login based data entry screens are provided. The App functions in both online mode and offline mode. Offline mode caters to capturing data in remote villages where mobile network is not available. Once the GVA returns to the network coverage area the mobile app synchronises with the server and data is updated.

A web interface is also available for the App and it can be accessed at **https://garv.gov.in**. Web interface provides the facility to generate MIS reports. The web interface also provides features for user management of GVAs, admin user profile for master data maintenance, approval screens for Regional office and Head office level approvals of the visit reports submitted by GVAs. The App has been developed using PHP frontend & MySQL database.

The reach of UE Mission has been enhanced through its social media presence on Facebook, Twitter and Instagram and is thus supported by a dedicated social media team who are interacting with users through latest communication tools.

2. **TEACHING OBJECTIVES**

➤ **Learning Objectives**
- As-is situation analysis and identification of pain points in the existing circumstances
- Importance of innovation and technology to bring transparency and proper accountability.
- Expected outcomes due to the project.

➤ **Challenges/Issues Faced**

REC had been facing difficulty in monitoring electrification process of villages. The pace of electrification was very slow as only 2,587 villages were electrified during 2012-13, 1197 villages during 2013-14 and only 1,405 during 2014-15. The remaining unelectrified villages are in hilly or difficult terrains, naxal affected areas and remote deserts. The actual number of unelectrified villages was not known and it was difficult to identify that whether a particular village has been declared electrified and whether fund for electrification has been sanctioned for the correct village. The state distribution companies were executing as well as reporting agencies and the villages being in remote areas, their electrification is considered economically nonviable venture.

➤ **Ways to Improve the Situation**

The quality and pace of work was ensured by milestone based independent monitoring through extensive field visits by trained civil engineers supported by photographs of each stage/ milestone of the work. A full-fledged project monitoring mechanism has been developed in the form of GARV App for all levels of administration and public at large with 100% transparency and accountability to track status of electrification works in remaining UE villages. The entire electrification process has been objectively divided into 12 milestones. To enable GARV App, young electrical engineers called 'Gram Vidyut Abhiyantas' (GVA) have been deployed to help in monitoring status of works in these 18,452 villages. The GVAs have been provided Android based tablets with GARV App installed. They visit individual villages and update milestone based progress of works being executed in these villages along with photographs of site. A record of visits is maintained along with visit wise status of milestone based progress alongwith photographs. Reasons for delay in execution of works can also be recorded for each village and delayed villages are highlighted on dashboard for speedy action & early resolution.

3. **SUGGESTED QUESTIONS & ANALYSIS**

a)   What challenges were faced during the implementation of UE Mission?
REC had been facing difficulty in monitoring electrification process of villages. The pace of electrification was very slow as only 2,587 villages were electrified during 2012-13, 1,197 villages during 2013-14 and only 1,405 during 2014-15.   The remaining unelectrified villages are in hilly or difficult terrains, naxal affected areas and remote deserts. The actual

no. of unelectrified villages were not known and it was difficult to identify that whether a particular village has been declared electrified and whether fund for electrification has been sanctioned for the correct village. The state distribution companies were executing as well as reporting agencies and the villages, being in remote areas, their electrification is considered economically nonviable venture.

b) How has GARV app helped in increasing efficiency and effectiveness in the system?

- Volume of transactions processed
  Till date, Gram Vidyut Abhiyantas (field engineers) have undertaken total 47,755 visits in 16,797 villages. On every visit, GVAs capture the milestone wise status of progress of electrification works along with photographs, details of existing infrastructure and new infrastructure, reasons for delay if any, and their remarks. Approximately 1.75 lakh photographs have been stored in the system to ensure transparency and accountability.

- Coping with transaction volume growth
  The system has been designed to easily handle the visit data for visits to all the 18,452 villages by the GVAs comprising of visit wise milestone status, remarks, infrastructure details and photographs.

- Time taken to process transactions,
  The data submitted by the GVA is uploaded in the system and is available on the dashboard after necessary approvals at regional and head office level. The approved data is available on the dashboard on click of mouse.

- Accuracy of output
  To ensure accuracy of the data displayed on the dashboard, different levels of approvals have been built in the system. The village wise visit data submitted by the GVA is first examined at the regional level followed by the head office level. The contact details of GVAs including their mobile numbers have been displayed on the dashboard to make the GVAs accountable for the data being captured by them and then uploaded to the system.

- Number of delays in service delivery
  It has been ensured that the information desired by all the stakeholders is readily available on the dashboard.

c) What are the distinctive features or accomplishments of the project?

The earlier system involved providing electrification progress data in terms of number of villages electrified during the month by State Distribution Companies, which had high possibility of errors.

The implementation of new Project Monitoring System in the form of GARV App was done to overcome all the weaknesses of the earlier system in terms of use of technology, milestone based reporting, deploying trained manpower, transparency, teamwork and involvement of all stakeholders to achieve the ultimate goal well ahead of given timeline.

Gram Vidyut Abhiyantas (GVAs): More than 350 young electrical engineers have been trained and deployed in these 18,452 villages for regular visits to these villages to independently capture the progress of electrification works in the GARV App along with reason for delay, if any.

4. Classroom Management

➢ Group Discussion

Divide the participants in groups of 4-5 and discuss the case on following aspects. Each group should take one aspect:

1. Discuss Change management and Communication as some of the key factors to project success.
2. Challenges, issues and risks if the project is to be rolled across other States.
3. What is next in the project?

Please have an open brainstorming session regarding how this project can be evolved and replicated in other States. Each group should present their findings in a short 5-10 minutes presentation afterwards.

➢ Group Activity (30 -40 minutes)

Make two groups of participants. One group has to act as major stakeholders, i.e. citizens located in the remote areas in requirement of electrification and other to act as Government.

Major Stakeholders: The task of the stakeholder group is to come up with novel and different (but realistic) service requirements that they want from a project like UE Mission. They should consider all the problems they face or they can face in future and build up a suggestion around them. They should also build a justifiable timeframe against each service they want to build in the system.

Government: The task of the Government group is to see how they can provide such services within shortest possible time. They should hold discussion with stakeholders to devise roadmap and implementation plan.

The objective of this exercise is to highlight expectations of stakeholders and the readiness of Government in meeting them. It is a role play type of exercise which offers plenty of flexibility in the way services can be further augmented.

Training of GVAs (if required): Roles & Responsibilities of GVAs:

- Visiting villages on a regular basis
- Capturing the milestone-wise progress including photographs of works

- Updating the progress on GARV app
- Coordinating with DISCOM officials, District Administration and REC

The Gram Vidyut Abhiyantas who are the barefoot soldiers of the UE mission are the young graduate electrical engineers to be chosen after rigorous selection process. These GVAs work under the supervision of experienced engineers called the District Vidyut Abhiyantas who train and guide them regarding practical situations faced during their village visits. The GVAs have to be trained regarding the use of GARV app to capture the progress of works. Routine workshops have to be conducted to motivate the GVAs and to equip them with the latest developments and acquaint them with quality aspects of the electrification. Apart from this, various formal and informal communication channels in the form of WhatsApp and email groups have to be developed to keep the entire team updated regarding the latest developments and to seek help from domain experts for any sort of clarification.

Hands on/ Field Training (if required): Training to employees for effective adoption of the system and maintain the system. Within Group activity, workshops and group training to be incorporated to ensure ease of use of application by the employees after go live.

The GVAs should be trained regarding the use of GARV app to capture the progress of works. Routine workshops are also conducted to motivate the GVAs and to equip them with the latest developments and acquaint them with quality aspects of the electrification.

➢ **Summary- Key lessons learnt (15 minutes)**

Each participant shall write down a summary in not more than 500 words highlighting key learning from the case.

<><><><><>

10.   ABBREVIATIONS

UE	Unelectrified
GVA	Gram Vidyut Abhiyanta
REC	Rural Electrification Corporation
ROW	Right of Way
DT	Distribution Transformer
LT	Low-tension Line
HT	High-tension
DDUGJY	Deen Dayal Upadhyay Gram Jyoti Yojana
SAGY	Sansad Adarsh Gram Yojana