Geospatial Management Information System (GMIS) – A step towards effective management @Smart Cities Mission

Project Summary

GMIS (Geospatial Management Information System) was made open to the 100 smart cities of India in December 2020 by the Ministry of Housing and Urban Affairs (MoHUA) as a Management Information System for all existing/new Smart City Projects. Formally launched in February 2021, the system has been used effectively by the 100 Smart cities, and by MoHUA for real-time monitoring the progress of 7,000 + projects worth over USD 30 Billion.

The objective behind the creation of GMIS was to provide better insights for mission management, create an extensive data repository of important mission-related data, introduce geospatial capabilities, and create a single engagement and monitoring platform for all officials involved in mission implementation. Geospatial mapping of projects with watermarked tags containing project ID, date and time, location in latitude and longitude opens new horizons for evidence-based planning, project monitoring, evaluation, and providing the information for policy making.

Challenges

Before the introduction of GMIS, there existed an MIS without geospatial visualization capabilities. Moreover, several operational challenges that prevented the department from achieving the desired results. The issues were deeply analyzed and a result, the department decided to conceptualize and design the new platform GMIS, with superior capabilities than the earlier MIS, thus greatly amplifying the mission's management capabilities.

To better connect with cities, state officials, and other Smart City stakeholders on the Smart Cities Mission efforts and achievements, MoHUA was looking for a system that can collate all project-related data in real-time and enable effective monitoring of projects. The challenge was to have an intervention that can provide inputs for policy formulation from all the reports which can be created through this data.

With an objective to:
- Map all projects on one platform
- Have all data in one single place
- Provide a comprehensive progress view of the 100 Smart Cities
- Create a user-friendly platform
- Enable evidence-based monitoring
- Integrate geospatial capabilities
- Facilitate knowledge sharing
- Monitor SLAs in real-time
- Align mission achievements with SDGs
- Track outcomes and impacts
- Create trust with stakeholders
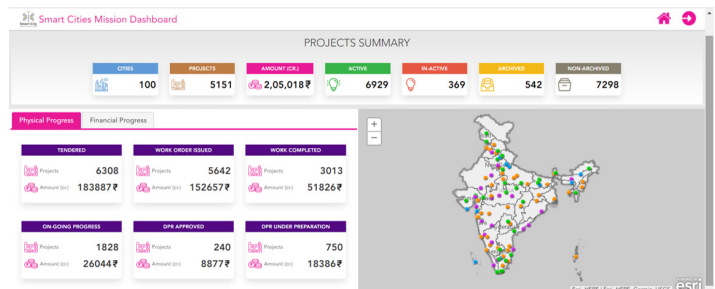- Bring transparency in program execution

Fig 1. Geo-spatial dashboard showing Smart City projects status

GMIS was introduced and launched by MoHUA to further boost the efforts towards making cities more self-reliant and meet the needs of and provide services to their citizens.

Solution

To overcome the challenges and ensure a streamlined flow of real-time information, MoHUA created a Geospatial Management Information System (GMIS). The three guiding principles which formed the basis of GMIS were:

1. Principle of Inclusivity
2. Principle of Competition
3. Principle of outcome orientation

GMIS is a web application developed on the Esri ArcGIS system. This application is designed for the advancement, and smooth running of services across the Smart Cities program and for enhanced monitoring using GIS (Geographic Information System) enabled services.

With GMIS, more than 7,000 Smart Cities projects have been mapped, enabling one to know their geo-coordinates, physical & financial progress, and view recent photos for every ongoing and completed project. The photos have been uploaded by cities using a mobile app which is configured on ArcGIS Survey123 for updating and visualizing the project status and progress of work. Only the authorized personnel have the necessary login and passwords to update the projects from the ground, conduct surveys via the survey app to update project details and its image and geo-tag. Once the project details are updated, it is categorized as 'active' on the GMIS portal.
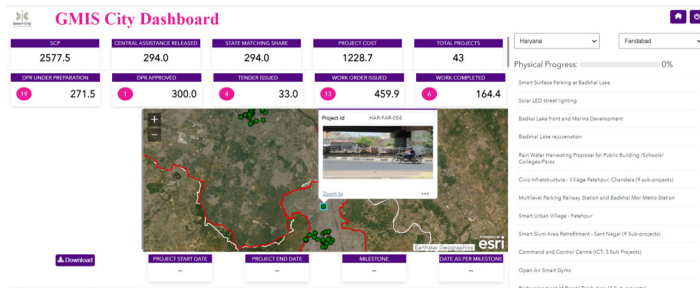

Figure 2: Project tracking through mobile apps

Business rules, which drive the entire operation, make up a critical management tool behind the whole exercise. The app is connected to the GMIS portal and synchronized with existing project IDs. This enhances the monitoring capabilities and transparency of all smart cities.

GMIS has the following modules:

- **Ranking Module:** To track the city's performance and benchmark other cities towards achieving the Smart City goals.
- **Smart City Performance Module:** This module gives visibility to the rank's movement w.r.t original rank to current rank.
- **Reports:** Various reports can be generated for different cities on all ongoing projects, geo-tagged projects, updated projects, and active/inactive projects.
- **Output-Outcome Measurement Module:** Provides information of various outcomes and impacts being generated by the Mission.
- **SDG Module:** Helps align Mission performance with the achievement of SDGs.
- **Vendor Repository Module:** Provides a view of existing vendors and adds new vendors for different smart city projects to have a record in place while providing transparency, ownership of projects, and SLAs.
- **City Progress Module:** This module provides the visibility of the physical progress of the projects in a city.
- **NIP (National Infrastructure Pipeline):** Launched in August 2020, NIP is meant for Augmenting India's infrastructure through Identifying key projects for investments. The users can click the edit button of a respective project to redirect it to NIP by filling the form.

GMIS also works as a gateway to all the platforms and initiatives launched under the Mission. Through a seamless and unified interface, the website aggregates all mission-related information and initiatives from the various platforms. The app drives convergence by fetching data and information directly from authorized personnel and automatic updates through APIs, eventually integrating action around the 5Ps: Planning, Project, Process, People, and Partnerships.

Benefits

GMIS is a simple, user-friendly platform with geo-enablement that is facilitating the cities to provide the details of their projects and support evidence-based monitoring of the projects. The system is flexible and highly customizable to keep real-time data handy for monitoring and alignment with various stakeholders. It can be accessed at the city, state, and national levels. The platform helps create trust, transparency, and collaboration.

So far, the GMIS has been used effectively by the 100 smart cities, and the mission management unit at Delhi for real-time monitoring of 7,000+ projects worth over $30 billion. Following are the few key benefits:

- Provides accessibility anytime and anywhere.
- Collaboration between cities, states, and central government through one single

application.
- Supports the mission in generating project-related data, which acts both as a source of truth and an instrument for data management and evidence-based project monitoring.
- Seamlessly integrates mobile-based data collection, geo-enabled MIS, geospatial dashboards, knowledge repositories over one platform.
- Ensures better investments in the projects for citizens, improving their living conditions.
- Provides real-time information to key stakeholders.
- Provides a comparison between cities, states, and thus helps in defining strategies for further action.
- Serves as a program management tool that helps in feeding policies from all the reports which are created with help of data available on GMIS.
- Monitoring of smart city projects at the city, state, and center through geospatial dashboards providing details of milestones achieved.

Figure 3: Charts showing the progress of different projects in Smart Cities

Figure 4: Images with location and date showing project status

Figure 5: Adding projects at Geo Location

Client
Ministry of Housing and Urban Affairs (MoHUA)

Website
https://gmis.smartcities.gov.in/

Location
New Delhi

Industry
Urban

Organization Profile

The Ministry of Housing and Urban Affairs (MoHUA) formulates policies, coordinates the activities of various authorities, and monitors programs concerning urban development in India. MoHUA is also responsible for implementing the National Smart Cities Mission, urban renewal, and retrofitting program.

Solution
ArcGIS