

A REVIEW OF APPLICATION OF IT & TECHNOLOGY IN GOVERNMENT SCHEMES

March 2022



सत्यमेव जयते



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PREFACE

The Government of India (GoI) spends close to Rs. 14 lakh crores annually on development activities, through nearly 750 schemes implemented by Union Ministries. In 2019, the Development Monitoring and Evaluation Office (DMEO), NITI Aayog was assigned to evaluate 28 Umbrella Centrally Sponsored Schemes (UCSS), which are schemes/programmes funded jointly by the Centre and the States and implemented by the States. This exercise, undertaken between April 2019 and February 2021, evaluated 125 Centrally Sponsored Schemes, under 10 Sectors, together covering close to 30% of the GoI's development expenditure, amounting to approximately Rs. 3 lakh crores per annum.

As a part of the evaluation studies, the Centrally Sponsored Schemes were also assessed based on various themes such as accountability and transparency mechanisms, use of technology, convergence, gender, social inclusion, regulatory framework, climate change, behaviour change, Research and Development and private sector participation. These evaluation studies adopted a mixed-method approach and underwent a review process involving consultations with NITI Aayog subject matter divisions, concerned Ministries and Departments, and external sector experts. For the thematic analysis across sectors, additional secondary research was undertaken by DMEO, and experts reviewed the findings in the respective domain to optimize the robustness of the evidence generated across the sectors.

The present report is an outcome of the thematic assessment of the use of technology across all the Centrally Sponsored Schemes. This report seeks to review the global and India's technology landscape. The report also develops a gap analysis framework based on the data life cycle and the questions incorporated in the Centrally Sponsored Schemes evaluation study reports related to technology used for assessing the performance of schemes, Sectors and Ministries/Departments. The report highlights the need for granular information for schemes/sectors in the public domain through Management Information Systems as well as the significance of utilizing mechanisms like Direct Benefit Transfer, Public Financial Management Systems, Geographical Information System, API integration and user-friendliness of technology platforms, dissemination of information through websites and mobile apps etc.

We hope that this report will help strengthen the use of technology in the design and implementation of central and state government programs. Building and adopting systems for enhancing the use of technology in government will greatly contribute to achieving national priorities and the well-being of all sovereign citizens of India.

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Our invaluable partners in this exercise have been officials across the Government of India and the State Governments without whose cooperation and insights this report would not have been possible. Next, we must thank our external expert, Dr. Samuel Asher, Assistant Professor of International Economics, Johns Hopkins SAIS and Co-founder, Development Data Lab for his critical inputs and feedback which helped us refine and bring coherence to the report. Special thanks are accorded to the implementation teams at M/s Deloitte Touche Tohmatsu India LLP, IPE Global Limited, Ernst and Young LLP and M/s KPMG Advisory Services Private Ltd, who worked against significant challenges to deliver the evaluation studies, which is the base of the analysis in this report.

DMEO team has been at the core of the thematic analysis, and this report would not have been possible without the contributions of Ms. Aishwarya Salvi, Ms. Fatima Mumtaz, Mr. Jayanta Patel and Ms. Shivangi Suri who worked tirelessly on every last detail of this arduous endeavour, under the guidance of Mr. Shailendra Dwivedi, Joint Secretary and Mr. Anand Trivedi, Director. Special thanks are extended to Mr. Ashutosh Jain, ex-Deputy Director General who played an important role in completing the study. The team would also like to thank Mr. Krishn Kant Sharma, Mr. Lav Bharadwaj, Ms. Nicole Almeida, Ms. Sanjana Manaktala, Mr. B. Sharlo Zack, Ms. Shivangi Saxena and Ms. Shruti Khanna for their support at various stages of the study. Across the thematic reports, Dr Shweta Sharma, Director, oversaw coordination, standardization, and monitoring of the processes.

In accordance with the massive scope and scale of the exercise, this report owes its successful completion to the dedicated efforts of a wide variety of stakeholders.

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LIST OF ABBREVIATIONS

NITI Aayog	National Institution for Transforming India (NITI) Aayog
DMEO	Development Monitoring and Evaluation Office
GoI	Government of India
NIC	National Informatics Centre
CS	Central Sector Scheme
CSS	Centrally Sponsored Schemes
ULBs	Urban Local Bodies
M/D	Ministries/Departments
PFMS	Public Financial Management System
DBT	Direct Benefit Transfer
IT	Information Technology
GIS	Geographic Information System
MIS	Management Information Systems
ICT	Information and Communications Technology
NPDD	National Programme for Dairy Development
SCM	Smart Cities Mission
GIGW	Guidelines for Indian Government Websites
SITE	Satellite Instructional Television Experiment
DoIT	Department of Information Technology
MGNREGA	National Rural Employment Guarantee Act
GP	Gram Panchayats
OFC	Optical Fibre Cable
SDG	Sustainable Development Goals
IoT	Internet of Things
IVRS	Interactive Voice Response System

MAI	Moisture Adequacy Index
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
AI	Artificial Intelligence
STQC	Standardisation Testing and Quality Certification
CPCS	Common Payment Card System
UPI	Unified Payments Interface
NeGP	National e-Governance Plan
LBS	Location Based Services
C2G	Citizen-to-Government
G2C	Government-to-Citizen
NAM	National Agriculture Market
ISAM	Integrated Scheme for Agricultural Marketing
POSHAN	Prime Minister's Overarching Scheme for Holistic Nutrition
AWC	Anganwadi Centre
AWW	Anganwadi Workers
SLWM	Solid and Liquid Waste Management
GPS	Global Positioning System
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
MoHUA	Ministry of Housing and Urban Affairs
SBM (U)	Swachh Bharat Mission - Urban
PMAY (U)	Pradhan Mantri Awas Yojana - Urban
DAY - NULM	Deendayal Antyodaya Yojana-National Urban Livelihoods Mission
CPSMS	Central Plan Scheme Monitoring System
PAHAL	Pratyaksh Hanstantrit Labh
NSAP	National Social Assistance Programme
PDS	Public Distribution System
SSA	Sarva Shiksha Abhiyan
MoEFCC	Ministry of Environment, Forest and Climate Change
MoTA	Ministry of Tribal Affairs
UC	Utilization Certificate

SOE	Statements of Accounts Expenses
KPIs	Key Performance Indicators
CEDA	Centre of Excellence of Data Analytics
NICSI	National Informatics Centre Services Incorporated
PoS	Point of Sale
JAM	Jan-Dhan-Aadhar-Mobile
BPL	Below Poverty Line
BSNL	Bharat Sanchar Nigam Limited
NOFN	National Optical Fibre Network
JSLPS	Jharkhand State Livelihood Promotion Society
UNDP	United Nations Development Programme
DAY-NRLM	Deendayal Antyodaya Yojana - National Rural Livelihoods Mission
SHG	Self Help Group
NRLPS	National Rural Livelihoods Promotion Society
USSD	Unstructured Supplementary Service Data
NPCI	National Payments Corporation of India
PMIS	Plantation Management Information System
MRSAC	Maharashtra Remote Sensing Application Centre
OBMMS	Online Beneficiary Management and Monitoring System
C.G.G	Centre for Good Governance
DoRD	Department of Rural Development
DDU-GKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
RSETIs	Rural Self Employment Training Institutes
PIAs	Project Implementation Agencies
SECC	Socio Economic and Caste Census
QR	Quick Response
CSP	Customer Service Providers
UAV	Unmanned Aerial Vehicles
DPR	Detailed Project Report
PGCIL	Power Grid Corporation of India Limited

OVERVIEW

The Department of Expenditure, Government of India had assigned the Development Monitoring and Evaluation Office (DMEO), an attached office of NITI Aayog, the responsibility of conducting third party evaluation studies of 126 Centrally Sponsored Schemes (CSS) across 9 sectors. One of the key themes covered during an analysis of all schemes was 'Use of IT and Technology'. The analysis in the following pages is based on reports of these evaluation studies conducted by DMEO in close collaboration with concerned Ministries/Departments (M/Ds), Scheme beneficiaries, Panchayati Raj representatives, Urban Local Bodies (ULBs), civil society organizations and external subject matter experts, along with an analysis of data available in the public domain.

This paper builds on the findings of the evaluation studies to assess the performance of schemes, sectors and M/Ds against the Use of IT and Technology for data generation and analysis, data availability and dissemination, and data quality assurance. This paper also attempts to shed light on the need for the IT-enabled mechanisms to be user friendly to increase their adoption amongst policy makers and citizens alike.

In order to evaluate technology usage under data generation and analysis theme, the availability, geographical granularity and data collection frequency of the Management Information Systems (MIS) dashboards were analysed for the schemes covered under the Umbrella Centrally Sponsored Schemes (CSS) evaluation study. It is found that around 71.3% of the schemes have an online MIS available. The granularity of data collected on these MISs is majorly at the state level (27%), and thus a need for more granular data collection is observed. It was found that the frequency at which data is reported on the dashboard was majorly taking place either monthly (32.6%) or in real-time (27.7%). However, it is observed that the majority of the scheme MIS dashboards are limited in their capability of performing analytics and act merely as a data reporting tool. Overall, the schemes have been performing well in the usage of technology for data generation. However, the adoption is limited for data analysis.

The second theme analysed in the report is the use of technology in data availability and dissemination. The areas of enquiry covered under this theme include the availability of data generated under the schemes in the public domain, user-friendliness of the IT tools developed, and the use of mobile applications and websites for dissemination of information to citizens and beneficiaries. Through the analysis, it is found that 70.7% of schemes had MIS available in the public domain. The remaining 44% of the schemes had a log-in id and password for their MIS portals. Thus, a clear need for increasing the availability of data in the public domain to enhance accountability and transparency is observed. Due to the unavailability of enough information through the CSS evaluation study for the user-friendliness of IT-enabled tools and use of websites and mobile app for dissemination of information, secondary data analysis was conducted. For user-friendliness and IT tools, the Guidelines for Indian Government Websites (GIGW) compliance of M/D websites was evaluated, and it was found that out of the 20 M/Ds that fall under the purview of this study, only 6 M/Ds had valid GIGW certificates as on 12th August 2021. Hence, a need for regular and timely verification of websites against the GIGW

guidelines was observed. For the dissemination of information, almost all schemes were found to have information/guidelines available on the M/Ds or the scheme website. The availability and usage of mobile apps for the dissemination of information and service delivery was analysed using the information made publicly available on the Mobile Seva AppStore. Data reveals that there are 984 total live apps on the store, out of which 479 applications are hosted by the central government for e-service delivery to beneficiaries.

The third theme evaluated the use of technology in data quality assurance. Under this theme, the adoption of geo-tagging, Direct Benefit Transfer (DBT) and Public Financial Management System (PFMS) by the schemes is analysed. The study reveals that out of the 81 schemes for which application of geo-tagging is possible, only 46 schemes are implementing this technology. For DBT and PFMS, 45% and 90% of the schemes are using these technologies, respectively.

Finally, the paper also looks at finance as an enabler for the adoption of technology in programme implementation and service delivery. Due to the unavailability of data of the fund allocation for the use of IT and technology for any scheme, the overall budget of a scheme and its performance rating in technology usage were analysed. It was found that the schemes in the rural development and urban transformation sectors are performing satisfactorily on this dimension irrespective of the budget of the scheme. The women and child development sector has satisfactory performance in its large budget schemes while the performance is average to low in low budget schemes. The schemes in health and jobs and skills sectors have been performing average to low irrespective of the budget.

Further, based on analysis of the CSS Evaluation reports, under scheme-wise findings, it was found that 33.6% of the schemes performed satisfactorily in the use of IT and technology, 42.7% had average performance, and 23.6% had poor performance.

Based on the performance of the schemes in use of IT and Technology under each ministry under the scope of this study, it was found that the schemes under the Department of Land Resources, Ministry of Housing and Urban Affairs, and Department of Rural Development was found to have the highest adoption of technology, while the scheme under Ministry of Labour and Employment and Department of Health and Family Welfare had the lowest technology adoption.

As a way forward, there is a need for all Ministries/Departments to make all schemes available via public, unrestricted MIS at the lowest granularity possible to enhance accountability and transparency and to develop a healthy public data ecosystem. While making data public, it is also important to ensure that the data is standardised across schemes to ensure that the different scheme datasets are comparable. The scheme-level MIS data must also be made available through Application Programming Interface (API) to help ease the process of bulk data transfers regularly.

Universalization of the adoption of DBT in subsidy schemes, and geo-tagging in infrastructure schemes is important to ensure quality in service delivery to beneficiaries.

In order to ensure that the use of technology becomes an integral part of the scheme life cycle, it is important to explicitly define the specifics at the scheme design stage itself. This may be done by adding a separate section for IT/Technology to the Expenditure Finance Committee (EFC)/ Standing Finance Committee (SFC) documents. A dedicated budget for the use of IT/Technology may be earmarked to Ministries/Departments at different administrative levels to execute technology-related implementation for schemes. A Technology Cell or a Data Strategy Unit (DSU) with subject matter experts may be formed to spearhead this execution. One such model for the DSU is prepared as part of the Data Governance Quality Index (DGQI) initiative, the detailed Terms of Reference (ToR) for which could be referenced (Overview: Data Governance Quality Index, 2022).

Along with setting up dedicated units for technology use and creating interoperable high-quality data sets, it is equally important to impart training to policy makers with the skills to enable data and technology-driven governance. Last but not least, in order to accelerate the pace of technology adoption in the government programmes, it is important to capitalize on the knowledge and expertise that sits outside the government through partnerships for drafting sustainable data architecture, implementation support for schemes/programmes, and capacity development for government staff.

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BACKGROUND

The term technology, a combination of the Greek technē, “art, craft,” with logos, “word, speech,” meant in Greece a discourse on the arts, both fine and applied. By mid-century technology was defined by such phrases as “the means or activity by which man seeks to change or manipulate his environment.” (Britannica, 2022)

India has been witnessing a revolution in technology and over the years, technology has played an integral role in the developmental process. Governments have incorporated technology beginning with the use of the radio, Satellite Instructional Television Experiment (SITE), SMS based Applications, Paper records etc. The Department of Information Technology (DoIT) was established in 2004 to give an impetus to the expansion of technology for the purpose of the nation’s growth which led to the commencement of programs/services like Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Online Income-Tax, Online Central Excise, Unique ID and E-office which paved path for the technological advancement of the nation.

With the launch of The Digital India programme in 2015, technology has been used intensively for governance, citizen-government interface, data management and monitoring etc. From 2013-2018 India, has experienced large-scale digital adoption with the second largest (MeitY, 2019) consumer base in the world. The rapid ramp-up of Aadhaar, the national biometric digital identity programme, and its subsequent linkage to the payment of welfare benefits are few of the initiatives led by government of India. Over 1.2 billion Indians now have Aadhaar digital identities, up from 510 million in 2013; nearly 870 million bank accounts were linked to Aadhaar by February 2018, compared with 399 million in April 2017 and just 56 million in January 2014 (MeitY, 2019).

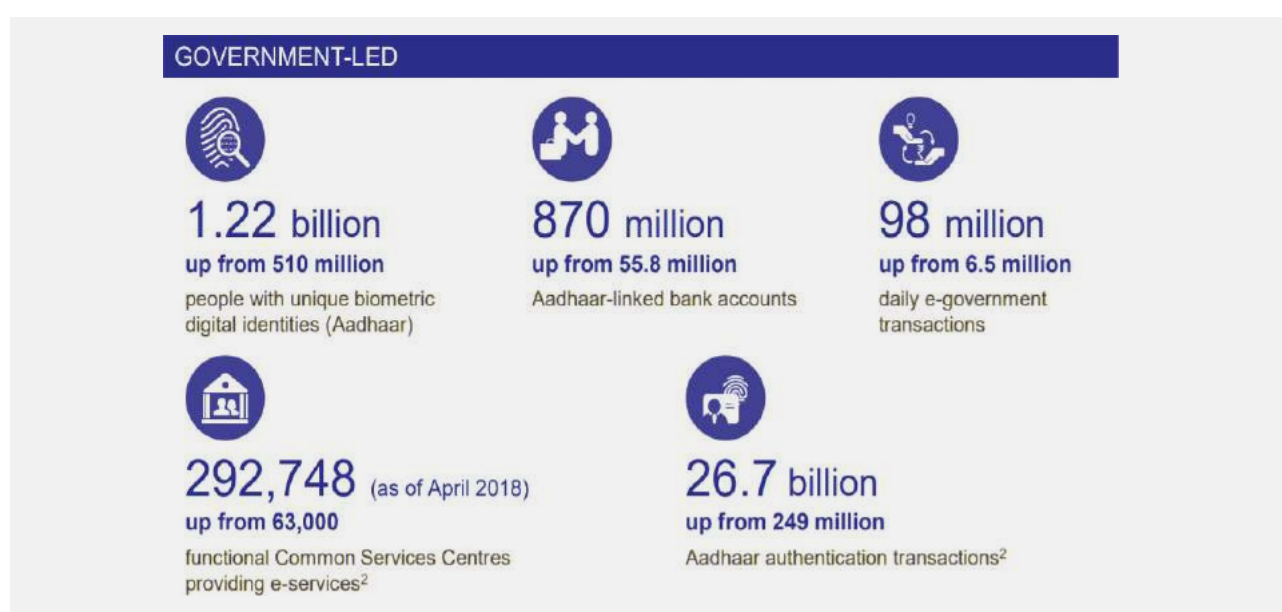


Figure 1: Penetration of IT/Technology usage in India through government led programmes

The aspiration for creating new digital ecosystem will enable India to become a vibrant digital economy up to \$1 trillion in economic value by 2025 (MeitY, 2019) which will pave the way for the country to become a digital factory for the rest of the world.

IT AND TECHNOLOGY LANDSCAPE

GLOBAL LANDSCAPE

Governments across the globe have realized that good data governance can contribute to coherent implementation of policies; smooth inter and intra governmental coordination; and provide effective service delivery for citizens. In this backdrop, data is being recognized by governments as a strategic asset and use of IT and Technology has exponentially increased to generate, store, process, analyse and share data.

The use of IT and Technology has gained momentum, especially in the wake of COVID-19 crisis. It is realized that during such public health emergencies, many activities and services, such as healthcare, education, and employment, must be converted online, with higher dependence of societies on Information and Communications Technology (ICT) and digital government systems. This has led to a big surge in adopting online service infrastructure and digital government portals (United Nations Department of Economic and Social Affairs, 2020).

As per a forecast study by Gartner, global government IT spending will rise to a total of \$483 billion in 2021, showing an increase of 5.1% from 2020 (Gartner, 2021). The study saw governments innovating at a quicker pace by adopting commercially viable technology solutions and data for operational and mission critical needs. As governments continue to embrace remote work and hyperconnected public services, spending on IT and Technology services and devices is expected to grow 5.6% in 2021, up from 1.6% growth in 2020 (see Figure 2 below) (Gartner, 2021).

Segment	2020	2020	2021	2021
	Spending Growth (%)		Spending Growth (%)	
IT Services	160,043	4.8	168,639	5.4
Software	108,212	8.9	118,149	9.2
Telecom Services	63,935	-0.5	67,200	5.1
Internal Services	63,927	1.0	62,423	-2.4
Devices	33,029	1.6	34,875	5.6
Data Center	30,279	5.7	31,514	4.1
Total	459,425	4.2	482,800	5.1

Figure 2: Government IT Spending Forecast by Segment, 2020-2021, Worldwide (Millions of U.S. Dollars (Gartner, 2021))

With growing demand of the citizens to have access to services through digital platforms, governments across the globe have a considerable ground to cover to ensure quality service delivery through digital platforms.

INDIA'S LANDSCAPE

India is home to 1.38 billion (World Bank, 2021) people. India has emerged as the global leader in real-time payments with over 41 million transactions per day (Business Standard, 2020). India stands second (India World Stats, 2022) to China in the world rankings for highest number of internet users in the world with an internet using population of 624 million (DATAREPORTAL, 2021). There are 1167.71 million mobile phone subscribers in India with an overall tele-density of 86.89% (Telecom Regulatory Authority of India, 2022). Under the BharatNet program, around 1.72 lakh gram panchayats (GPs) are connected through Optical Fibre Cable (OFC) and around 53,913 GPs have active Wi-Fi connections (BBNL, 2022). As part of the largest digital literacy program in the world, around 3.4 crore (MeitY, 2022) out of 6 crore rural households have been certified as digitally literate. Through the e-governance initiatives under the 'Digital India' scheme, the government has rolled out numerous services digitally either through online portals or mobile applications (National e-Governance Division, 2022).

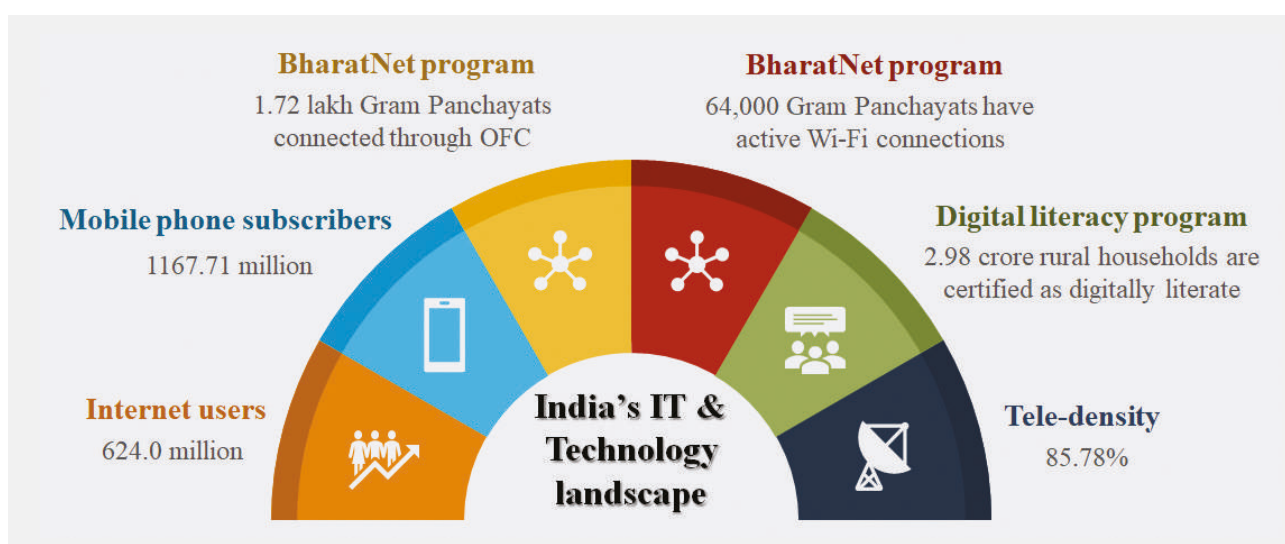


Figure 3: India's IT & Technology landscape

While the achievements in digital outreach have been significant, there is still a long road ahead. In the global rankings, India is positioned 100th out of 191 (UNDESA, 2020) countries in the E-government Development Index, and 67th out of 130 (Portulans Institute, 2021) countries in the Network Readiness Index. The two global indices measure the performance of a country on accessibility, usage and impact of Information and Communication Technology (ICT). While India ranks high on accessibility of online services to the citizens in the e-government development index, it ranks low on infrastructure and human capital. When it comes to the Network Readiness Index, the strongest showings of India relate to Governments, Future technologies and Economy, while the weakest performance is in the areas of individuals (includes human capital skills and internet and mobile subscriptions), quality of life and Sustainable Development Goals (SDG) contribution.

While the IT sector in India is still growing, the current coverage and connectivity provides policy makers with a unique opportunity to leverage the new and the emerging in policy life cycle.

ICT is being used by the government for collection of higher-frequency quantitative as well as qualitative data with a wider coverage to remote rural areas through the use of digital and telephonic surveys, geo-spatial mapping (Bhuvan, 2022), Internet of Things (IoT) devices (Department of

Drinking Water and Sanitation, 2022), Interactive Voice Response System (IVRS) technology (Ministry of Education, 2022) etc. across various schemes for the purpose of monitoring and service delivery.

In the designing stage, usage of ICT tools enables planning and decision making through information systems i.e., storing of information into electronic databases which helps the decision makers to retain data elements to further strengthen the decision-making process. ICT has further enabled public consultations through e-polls, e-discussions, e-ballots which helps the policy makers to understand the opinions and feedback of general public on policy related issues.

In the implementation phase, majority of the schemes are using MIS to facilitate the flow of information from the ground to the policy makers and the public in order to enable course corrective measures and enhance transparency. There is an increase in adoption of technologies such as cashless money transfer through DBT and PFMS improving quality of service delivery by cutting down on implementation time in schemes involving fund transfer. Recently, the government launched e-RUPI, a cashless and contactless instrument for digital payment. The e-RUPI voucher is said to play a huge role in making DBT more effective in digital transactions and will give a new dimension to digital governance (Ministry of Finance, 2021). In schemes where creation of physical assets is involved, Geographic Information System (GIS) technology is seeing an increased adoption in order to ensure that the projects are completed and quality is maintained. To enable wider adoption of this technology in rural as well as urban areas alike, affordable devices such as mobile phones are being utilised for data collection purposes.

While technology adoption is witnessing growth in data generation, availability, dissemination and quality assurance, its' use for the purpose of analysis is fairly limited. Most of the MIS tools and dashboards maintained by the government are mere data reporting tools with fairly restricted or no use of analytics. The government is still in the initial stages of understanding and imbibing the large amounts of data generated in the day-to-day decision making process.

India is at a pivotal point in unlocking its digital economy and making e-governance a ubiquitous affair in the years to come. The Covid-19 pandemic has been a crucial phase not only for organizations but also for central and local governments to reconsider their outlook towards IT as an enabler for business continuity (The Economic Times, 2021). Being mindful of the new reality, the government has been tasked with an added responsibility towards re-thinking all aspects of the scheme life cycle to enable seamless service delivery to end beneficiaries by leveraging new and emerging technological approaches in programme implementation.

OBJECTIVE AND METHODOLOGY

The objective of this report is to explore the use of IT & Technology by M/Ds in driving efficiency and effectiveness in scheme implementation in each sector. Based on this analysis, the report aims to facilitate and recommend deepening of the use of IT & Technology in the implementation of schemes by M/Ds in each sector. The analysis is conducted using data and reports from multiple sources. The methodology adopted for this report is as follows:

STAGE I: ANALYSIS OF CENTRALLY SPONSORED SCHEME (CSS) EVALUATION REPORTS

Relevant data on the use of IT & Technology across all sectors is gathered from CSS evaluation reports. A repository is created based on the relevant data gathered, which further synthesized information on two levels:

- **Sector level:** Existing problems plaguing the sector; what kind of technology is being used to overcome these problems; and how is this technology helping across the value chain, such as in improving scheme efficiency, training and capacity building of service providers, developing effective monitoring mechanism.
- **Scheme level:** A list of schemes (which were a part of the CSS evaluation reports) are collated under every sector. The use of IT and technology in schemes is analysed over the data life cycle; kind and function of technology being used currently; challenges faced in technology used currently; best practices identified and recommendations provided in the CSS evaluation reports to overcome these challenges. This part also captures the rating (such as satisfactory, average, needs improvement) given in the report to each scheme for the current use of IT & Technology.

STAGE II: SUPPLEMENTARY SECONDARY RESEARCH

Secondary research is conducted to supplement the information synthesized from the CSS evaluation reports. The secondary research includes large datasets from the MIS maintained for each scheme, mission and scheme websites, relevant published reports by various government and non-governmental agencies, and published papers in international journals. The information extracted from these secondary sources is synthesized and analysed to capture the exploratory use of IT & technology, adoption of the latest technologies and best practices at a local, state, national level.

The above 2 stages were further analysed using a **gap analysis framework** as follows:

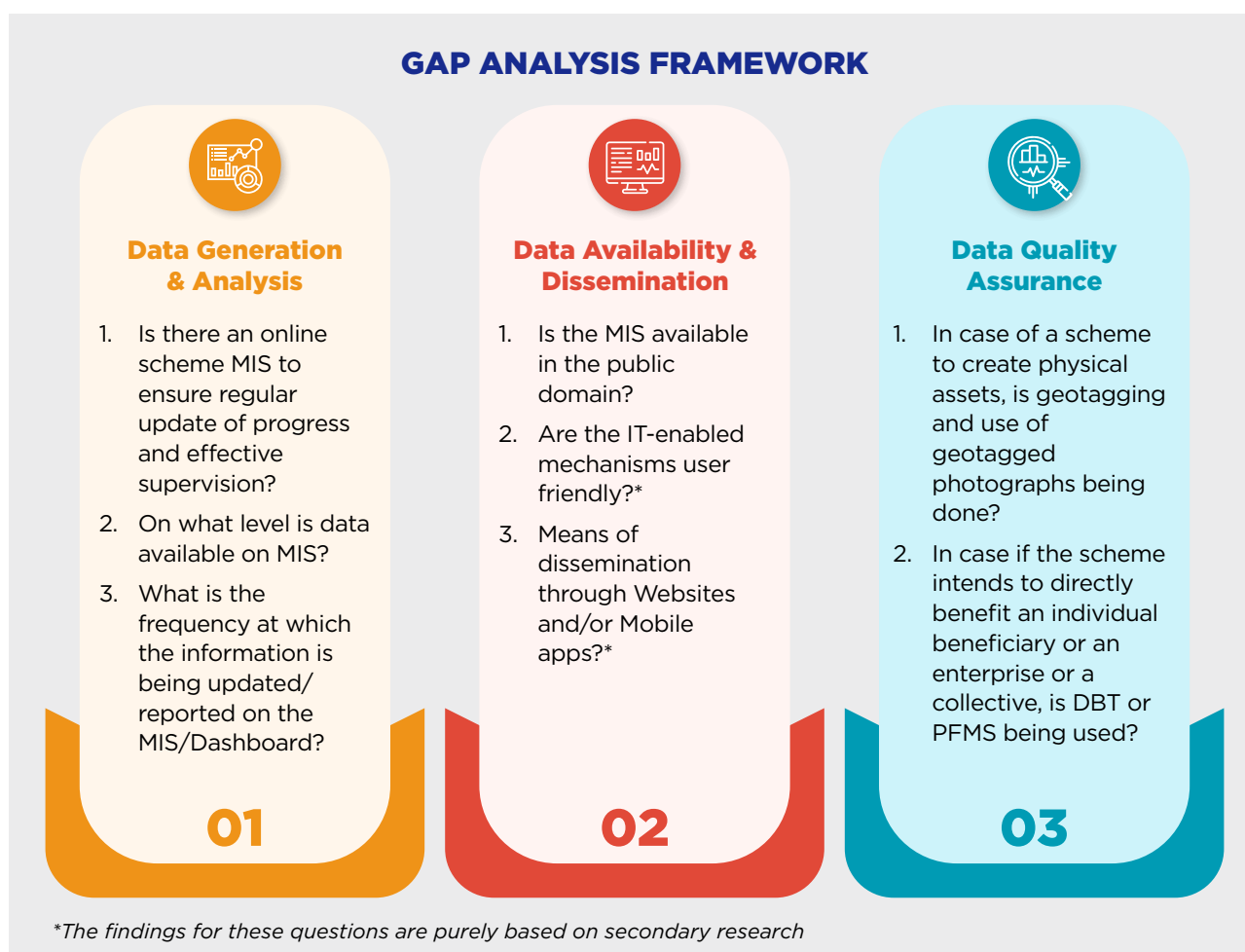


Figure 4: Gap Analysis Framework

The gap analysis is designed based on life cycle of data. The data life cycle is the sequence of stages that a particular unit of data goes through from its initial generation or capture to its eventual archival and/or deletion at the end of its useful life (WhatIs.com, 2022). Using data life cycle as a foundation of gap analysis would help the study to systematically navigate through all the processes involved in the data ecosystem and facilitate in recommending solutions to effectively resolve gaps across the life cycle. In order to fully understand the gaps in the use of IT and technology in scheme implementation, the report dissects the data life cycle into three main dimensions – Data generation and analysis; Data availability and dissemination; and Data quality assurance. The gap analysis also frames research questions based on the questionnaire used for the CSS Evaluation study. This questionnaire was prepared for the target beneficiaries based on the areas of enquiries identified under the REESI+E framework (OECD, 2022). Hence, the performance of M/Ds, sectors and schemes is assessed under these three broad dimensions.

Based on the CSS evaluations conducted by NITI Aayog, this report covers **115 schemes**. Following is the breakdown of the number of schemes covered across different sectors.

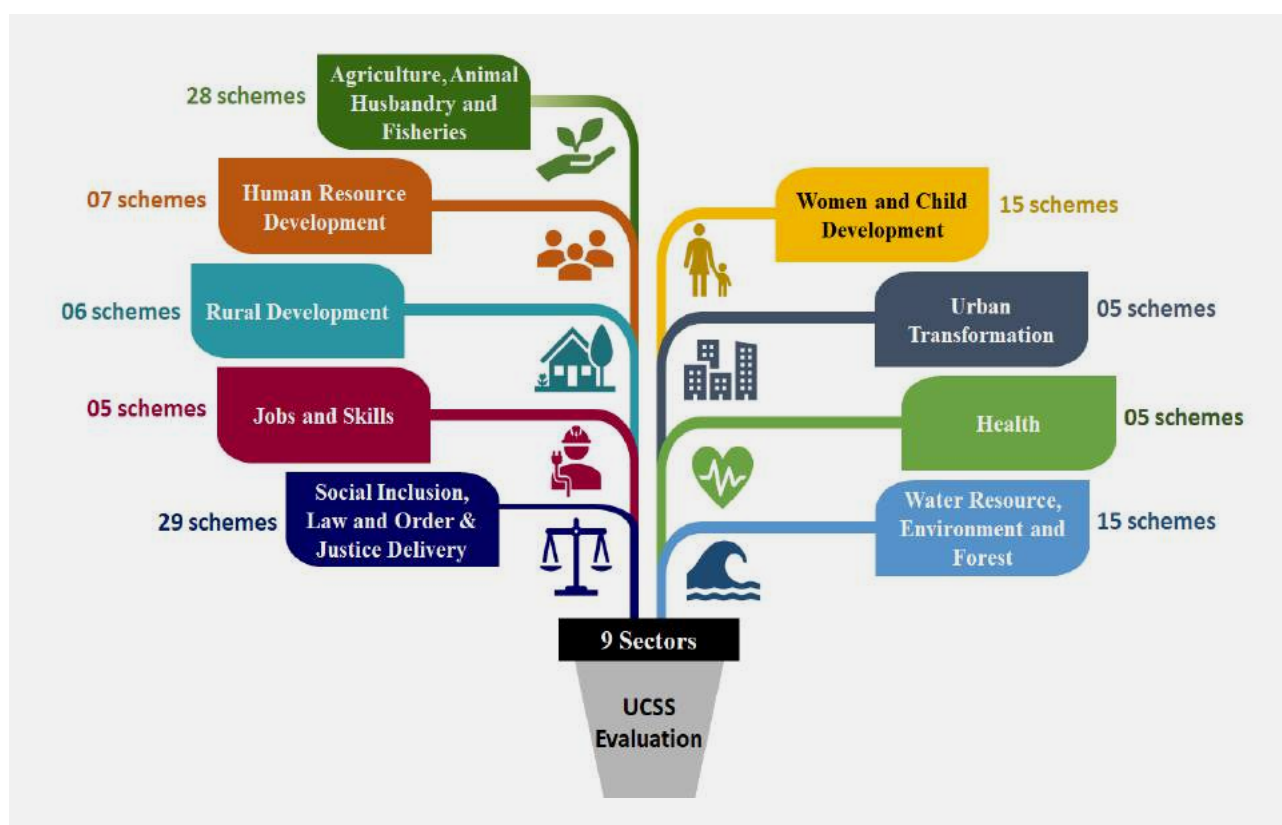


Figure 5: Sectors and schemes coverage under the report

LIMITATIONS OF THE STUDY

- The analysis presented focusses only on Centrally Sponsored Schemes under implementation during the reference period for the evaluation (2015-20) and does not consider non-schematic interventions (including Other Central Sector Expenditure).
- The analysis presented is purely based on availability and the assessment of quality of information is not in scope of this analysis.
- Availability and usage of DBT, PFMS, and Geo-tagging is based solely on information received by DMEO during CSS evaluation and has not been corroborated with any other source.
- Some CSS schemes have been discontinued or merged with other schemes post the reference period for the evaluation. This study does not differentiate between these and other schemes

GAP ANALYSIS

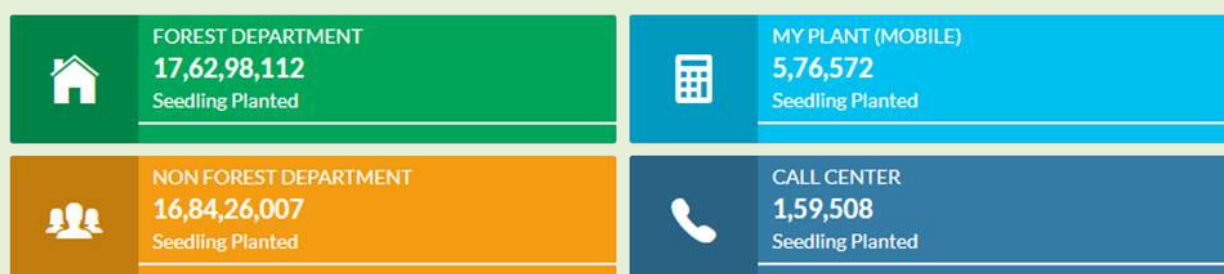
A gap analysis framework is used to further analyse the findings from the CSS Evaluation reports supplemented by secondary research. The framework has 3 areas of inquiry in the use of IT and Technology (categorized as 3 dimensions), namely Data Generation and Analysis; Data Availability and Dissemination; Data Quality Assurance. Each dimension covers specific research questions of enquiry. Through this gap analysis, the report aims to come out with findings on the performance of sectors, M/Ds and schemes in the use of IT and Technology, identify gaps, showcase best practices and provide recommendations.

DIMENSION I: DATA GENERATION AND ANALYSIS

With the implementation of the CSS schemes, a large amount of data is being created and collated by M/Ds. Data ranges from characteristics of beneficiaries to project features; and progress of project implementation; services delivery and the processes involved. With many focused initiatives in the digital area, transformational changes have been observed in the last few years in the ways the government uses IT and Technology in data generation and analysis.

Case Study 1: MIS for plantations in Maharashtra (Government of Maharashtra, 2022)

Maharashtra has implemented a real-time Plantation Management Information System (PMIS) for reporting forest conservation and protection related activities such as, afforestation as well as reporting of fire incidents. PMIS is guided by the State's ambitious 50-Cr. Plantation Programme under the Green Maharashtra Mission. For fully leveraging the MIS, digital connectivity among all the offices at range, division, and circle level, and headquarters is the essential prerequisite. This was achieved by utilizing National Informatics Centre (NIC) enabled leased line and Bharat Sanchar Nigam Limited (BSNL)'s broad based connectivity.



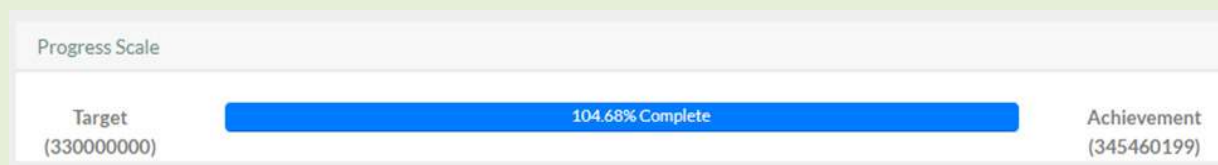


Figure 6: Snapshot of Maharashtra's PMIS

The portal reports data about the plantation sites, number of saplings planted in those areas, and their monitoring including the survival rate of the saplings. PMIS has gained significant momentum in the last three years. It enabled the Department to monitor plantation of 2,81,38,634 saplings over 65,675 sites under 2-Cr. Plantation Drive on 1st July 2016 followed by monitoring of plantation of 5,43,35,049 saplings over 94,257 plantation sites under the 4-Cr. Plantation Drive during the 2017 Monsoon. During the 2018 monsoon, plantation of 15,88,71,352 saplings over 1,45,683 plantation sites under the 13-Cr. Plantation Drive was monitored.

PMIS was integrated with mobile based Application 'Vanyukt Shivar', for monitoring pre-plantation, plantation and post-plantation survival monitoring. Vanyukt Shivar app, developed by Maharashtra Remote Sensing Application Centre (MRSAC), enables field officials to monitor survival and capturing/reporting photographs of survival. Additionally, 'MyPlants' mobile app was developed to enable non-Forest stakeholders as well to upload information about plantation undertaken during the plantation drive. 'My Plants' app enables people and organisations to feed in the data about the number of saplings they planted with the Forest Department. This includes details such as numbers of plants and species among other details, which creates a database of trees. The information captured in the app is automatically fed in the department website, thereby creating an integrated approach for reporting the aforementioned activities.

This MIS has also generated interest among other states as a good practice and plans are in place for adopting the model.

In this data age, several M/Ds have established mechanisms by using IT and Technology to gather scheme level data in the form of MIS. Scheme level data is captured by the MIS at different frequencies such as real-time, daily, monthly, quarterly and annually; and at various levels such as individual, household, facility, village/district, city, state, national and project level. While several M/Ds capture MIS data, very few M/Ds have an online MIS which is in the public domain or use this data for scheme analysis and decision making.

For the purposes of analysis of this dimension, following questions are considered to test the use of IT and Technology for data generation and analysis:

1. Is there an online scheme MIS to ensure regular update of progress and effective supervision?
2. On what level is data available on MIS?
3. What is the frequency at which the information is being updated/reported on the MIS/Dashboard?

Based on CSS Evaluation reports and secondary research, this dimension provides an insight on the readiness of the M/Ds and sectors with respect to use of IT and Technology for data generation and analysis in the implementation of schemes.

1. Online scheme MIS to ensure regular update of progress and effective supervision

MIS can play a critical role in the implementation of a scheme in terms of monitoring periodic progress. A well-designed MIS facilitates the flow of information among various levels of government and enables informed planning, management and implementation of a scheme. The MIS can be used for regular updating of both the progress and output indicators in order to comprehend the relation between outputs and objectives. Hence, the generic MIS communicates the involved relationship between budgets, activities, and outputs; and enables monitoring of the process of scheme implementation (Santosh Mehrotra, D. Indrakumar and Vijay Saxena, 2013).

A scheme level gap analysis was conducted covering 115 schemes across 9 packages to study whether schemes had an online MIS to ensure regular update of schematic progress and effective supervision.

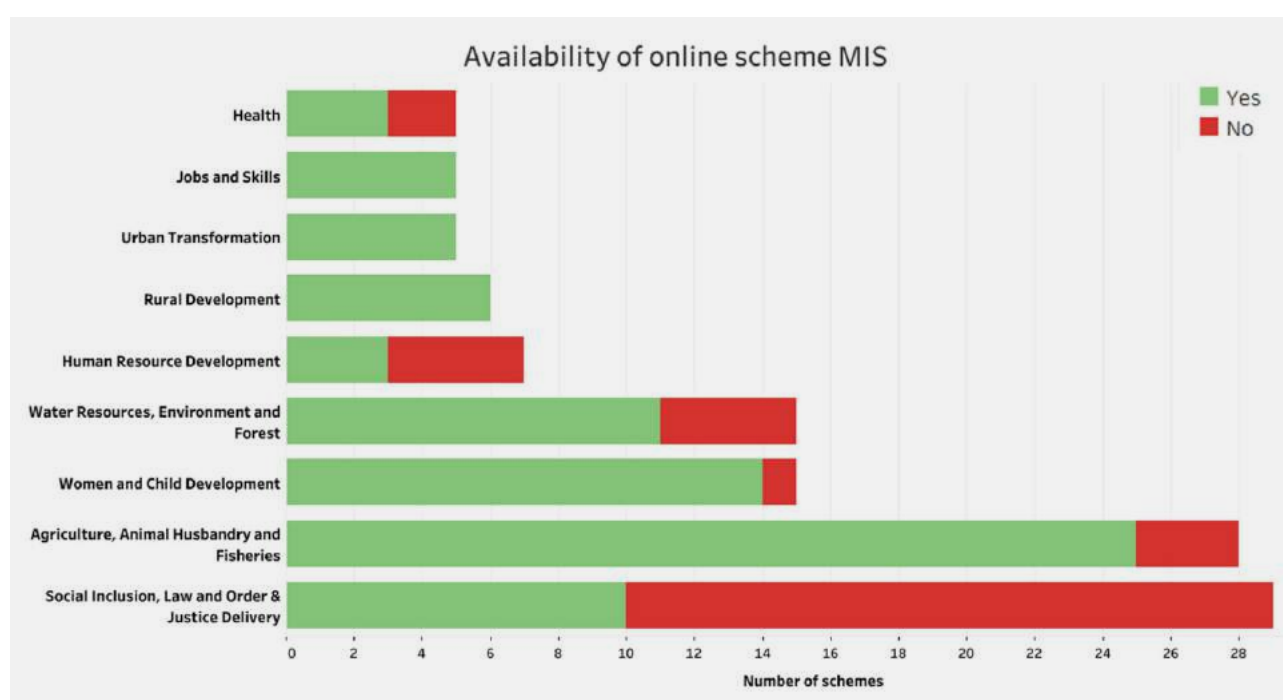


Figure 7: Sector-wise availability of online scheme MIS

At a scheme level, it was found that **71.3%** of the schemes had an online scheme MIS available (82 out of 115 schemes). The remaining 28.7% of the schemes either had paper-based MIS or the M/Ds were in the process of developing an MIS or the schemes did not have any MIS in place.

At a sector level (See Figure 7), it was found that majority schemes not having an online scheme MIS fell under Social Inclusion, Law and Order & Justice Delivery sector (19/29 schemes). Whereas, it was found that only 3 sectors namely, Urban Transformation sector (5/5 schemes); Rural Development sector (6/6 schemes); and Jobs and Skills sector (5/5 schemes), had an online MIS for all schemes.

Case Study 2: Smart Cities Mission (SCM) Management Information Systems (DMEQ, 2021)

The Mission tracks progress of 100 Mission cities with help of a comprehensive web-based MIS. The MIS captures project information, implementing agency details, project milestones, fund disbursement and utilisation, and is periodically updated by the Special Purpose Vehicles.



Figure 8: Snapshot of SCM-MIS tracking. Source: Smart Cities Mission MIS database

Though the scheme MIS is comprehensive, key parameters such as baseline service levels, target project capacities, project capacity achieved are not captured. Moreover, the MIS tracking does not focus adequately on capacities created, citizens impacted/user base; geographic impact area (only does so for limited project types).

While there is a National level MIS tracking, it was found that there is no tracking across any system or MIS that is maintained at the State level, that provides a more intense/closer monitoring of SCM project implementation of cities within the State.

2. Granularity of data available on MIS

One of the defining parameters of a good MIS data is the granularity of data collected. Granularity refers to the amount of disaggregation available for key data elements. Granularity can be expressed in units of time, level of geographic detail available, or the amount of detail available on any of a number of characteristics (e.g., demographic, socio-economic) (Federal Committee on Statistical Methodology, 2020). This section will focus on geographical/beneficiary level granularity of data collected on MIS.

A scheme level gap analysis was conducted covering 63 schemes across 9 packages to study the level on which data is collected using MIS. While the level of granularity depends on the nature of the scheme, it was found that the majority of scheme MIS had **State level data (27%)**; followed by **beneficiary level data (19%)**; and **district level data (15.9%)** available on MIS.

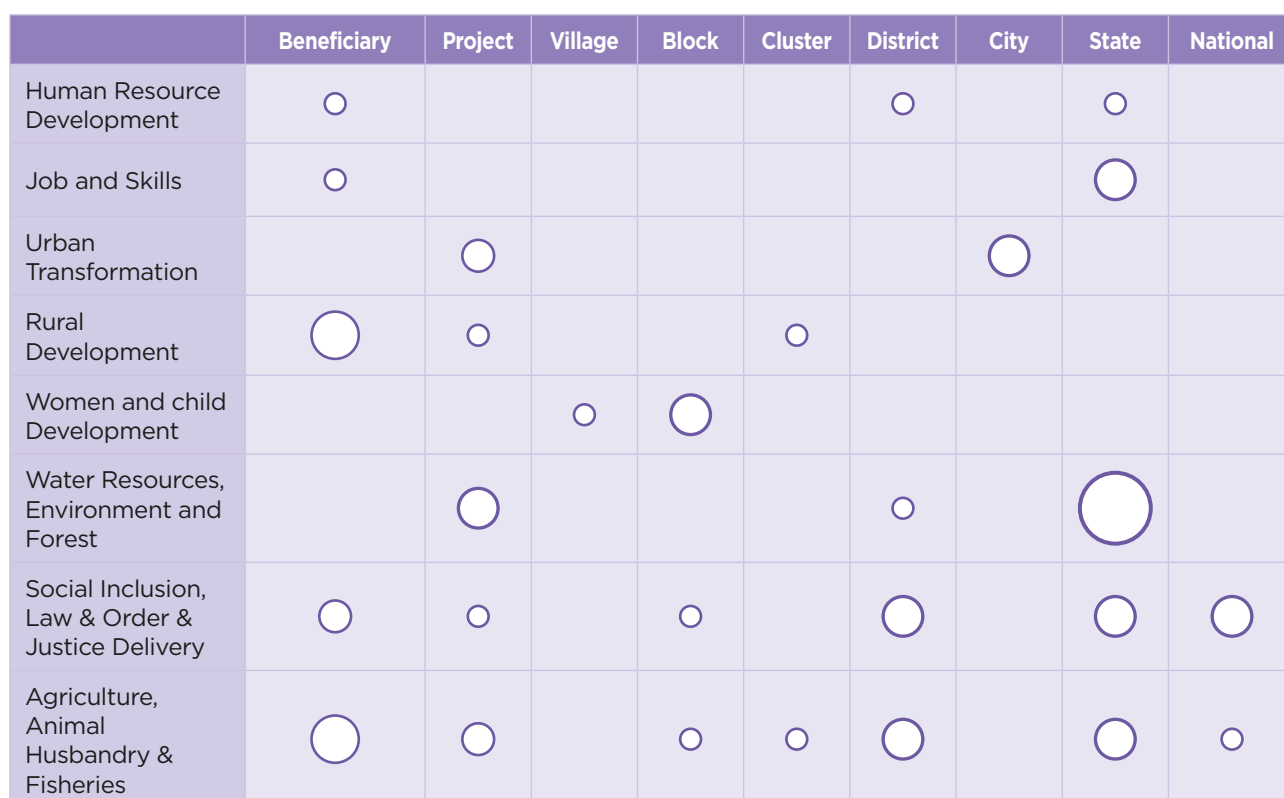


Figure 9: Sector-wise availability of online scheme MIS¹

Further, the lowest level of granularity available in the MIS was compared against the desirability of the MIS system in the schemes. It was found that beneficiary and project level data has been collected only for 21% and 30% schemes respectively, where applicable. For the remaining schemes, data is not being collected at the lowest granularity possible.

At a sector level (See Figure 9) it was found that State level granularity of data was captured largely under 3 sectors, namely, Water Resources, Environment and Forest; followed by Agriculture, Animal Husbandry and Fisheries; Jobs and Skills; Social Inclusion, Law and Order & Justice Delivery. Beneficiary level granularity of data was captured largely under 2 sectors, namely, Agriculture, Animal Husbandry and Fisheries; and Rural Development. District level granularity of data was captured largely under 2 sectors, namely, Social Inclusion, Law and Order & Justice Delivery; and Agriculture, Animal Husbandry and Fisheries.

Case Study 3: MIS Narratives for Jharkhand State Rural Livelihood Mission (SRLM) (Institute of Rural Management Anand, 2017)

MIS in Jharkhand State Livelihood Promotion Society (JSLPS) is claimed to be path-breaking. Initially, United Nations Development Programme (UNDP) sponsored for development of MIS in 2010. JSLPS worked as a nodal agency for Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM). Its software e-SHG (Self Help Group) process tracking is adopted as e-NRLPS (National Rural Livelihoods Promotion Society). e-NRLPS has modules on saving, credit, repayment and attendance. JSLPS has servers for file, Tally enterprise, and web

¹ Size of the bubble is directly proportional to the number of schemes under a specific category

services. It has private cloud services (Go Daddy), internet of 10mbps leased line. Every district has one MIS officer. There are MIS bookkeepers and “tablet didis” who earn Rs.20/- per meeting for data entry and reporting.

Though there is no attempt to have mobile-based applications, SMS services are provided to SHGs, cadres and staff at block/clusters. It has introduced Unstructured Supplementary Service Data (USSD) authentication through National Payments Corporation of India (NPCI), Aadhar is in place for every member. Further, Mahila Kisan Sashaktikaran Pariyojana (MKSP) MIS is web-based and is being prototyped--toll-free number is being used for supporting data entry.

Apart from this, JSLPS has introduced alert systems (every Tuesday), dynamic block ranking system and toll-free number for Didis to interact. Services like: SHG member transaction, on-line timely disbursement of funds on time is tracked here. This use of digital technology helps in resolving beneficiary issues.

3. Frequency of information updation and/or reporting on the MIS/ Dashboard

The consistency and frequency at which data is updated and/or reported on MIS/Dashboard is another defining criteria of a good MIS.

	Real-time	Daily	Monthly	Quarterly	Yearly
Health				○	
Human Resource Development					○
Urban Transformation			○		
Water Resources, Environment and Forest	○				○
Job and Skills	○		○		
Rural Development	○	○		○	
Women and child Development	○		○	○	
Social Inclusion, Law & Order & Justice Delivery	○		○		
Agriculture, Animal Husbandry & Fisheries	○		○		○

Figure 10: Sector-wise frequency of updating/reporting on MIS²

A scheme level gap analysis was conducted covering 47 schemes across 9 packages to study the frequency at which data is updated/reported on MIS. It was found that the majority of the schemes updated/reported data on a **monthly frequency (32.6%)**; followed by **real-time (27.7%)** and **yearly (17%)** updation/reporting on MIS.

² Size of the bubble is directly proportional to the number of schemes under a specific category

At a sector level (See Figure 10) it was found that monthly frequency of updation/reporting was majorly done by 2 sectors, namely, Jobs and Skills; and Social Inclusion, Law and Order & Justice Delivery. Real-time data updation/reporting was done by 2 sectors, namely, Agriculture, Animal Husbandry and Fisheries; and Women and Child Development. Yearly data updation/reporting was majorly done by the Agriculture, Animal Husbandry and Fisheries sector.

Case Study 4: Use of predictive analytics in agriculture (DMEQ, 2020)

Challenge:

Typically, farmers in India use age-old methods to predict the right sowing date for their crops. While these methods had worked well in the past, the changing weather patterns in the past decade have led to unpredictable monsoons, causing poor crop yields. This impacted farmers' incomes and increased their vulnerabilities, causing many to commit suicides as they could not repay their loans on time.

Solution:

Microsoft partnered with International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and Andhra Pradesh government to develop the Sowing App, a mobile application that uses predictive analytics to advise Indian farmers on the best time to sow crops, depending on weather conditions, soil, and other key indicators. The app aims to reduce failures and increase yield by arming farmers with information helpful in making critical decisions.

To calculate the crop-sowing period, historic climate data spanning over 30 years, from 1986 to 2015 in Andhra Pradesh was analysed using AI. To determine the optimal sowing period, the Moisture Adequacy Index (MAI) was calculated. MAI is the standardized measure used for assessing the degree of adequacy of rainfall and soil moisture to meet the potential water requirement of crops. The real-time MAI is calculated from the daily rainfall recorded and reported by the Andhra Pradesh State Development Planning Society. The future MAI is calculated from weather forecasting models for the area provided by USA-based aWhere Inc. This data is then downscaled to build predictability, and guide farmers to pick the ideal sowing week.

Sowing advisories are then initiated and disseminated until the harvesting is complete. The advisories contain essential information including the optimal sowing date, soil test based fertilizer application, farm yard manure application, seed treatment, optimum sowing depth, and more. In tandem with the app, a personalized village advisory dashboard provides important insights into soil health, recommended fertilizer, and seven-day weather forecasts.

Impact:

In 2017, the program touched more than 3,000 farmers across the states of Andhra Pradesh and Karnataka during the Kharif crop cycle (rainy season) for a host of crops including groundnut, ragi, maize, rice and cotton, among others. The increase in yield ranged from 10% to 30% across crops.

Case Study 5: Andhra Pradesh Online Beneficiary Management and Monitoring System (OBMMS) (Centre for Good Governance, 2022)

Andhra Pradesh introduced OBMMS Software Package developed with the assistance of the Centre for Good Governance (C.G.G) in 2015-16 and implemented in all 13 districts to improve the Planning, Monitoring and Service delivery in the implementation of Economic Support Schemes. OBMMS covers individuals and groups belonging to vulnerable & disadvantaged sections under Government of Andhra Pradesh bank linked schemes being implemented by 7 Welfare Corporations and 11 Federations. The scheme covers 3 lakh beneficiaries every year with outlay of more than Rs. 5000 crores.

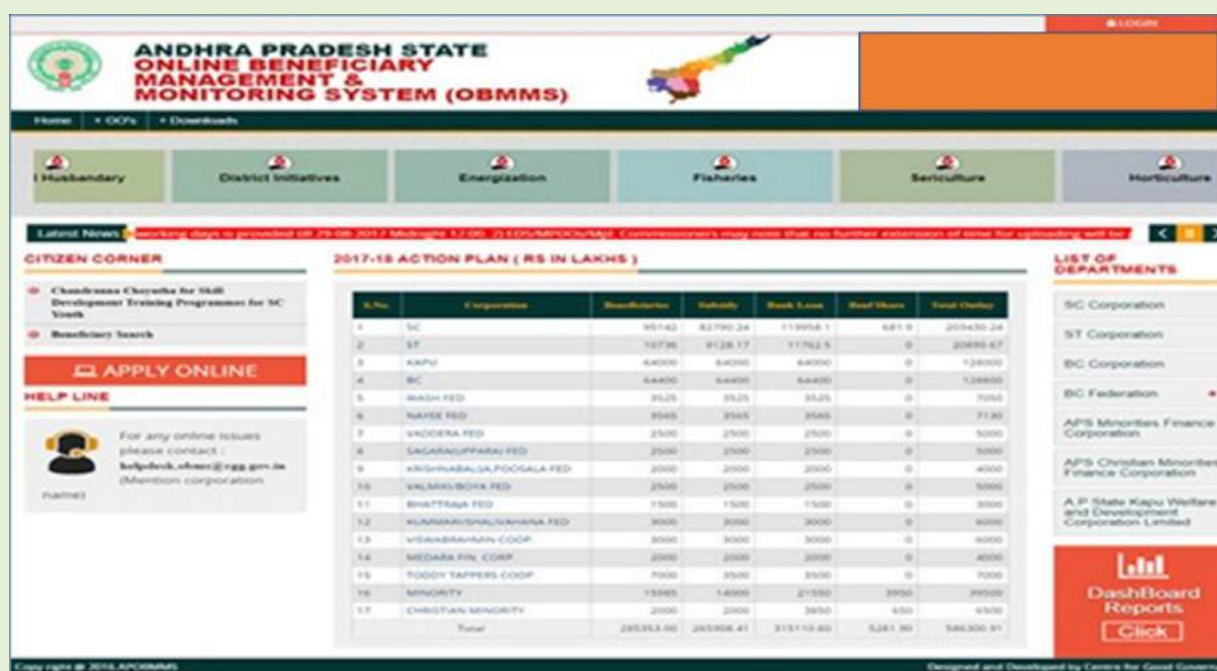


Figure 11: Andhra Pradesh OBMMS Dashboard

The platform has been able to solve multiple issues such as 48 lakhs or more paper sheets saved during the process with effectively reducing the time taken to avail the schemes by 8-10 hours per beneficiary. Further the staff productivity increased by 30 percent between 2014-15 to 2018-19.

DIMENSION II: DATA AVAILABILITY AND DISSEMINATION

While data generation and analysis of data forms a core requirement for policy analysis by decision makers, in order to enhance accountability and transparency considering data as a public good it is equally important to make the data available for public consumption. While doing so it is important that the data is processed and made public in an easy-to-understand fashion by the public. Further, not only should the data be easy to understand but also the websites/applications must be user friendly to make navigation, searching and analysing various data points easy. It is also important that the information dissemination takes place through technology tools that are widely used by the beneficiaries.

For the purposes of analysis of this dimension, following questions are considered to test the use of IT and technology for data availability and dissemination:

1. Availability of MIS in the public domain
2. Are the IT-enabled mechanisms user friendly?
3. Use of websites and mobile apps for information dissemination

Based on CSS Evaluation reports and secondary research, this dimension provides an insight on the readiness of the M/Ds and sectors with respect to use of IT and technology for data availability and implementation of schemes.

1. Availability of MIS in the public domain

A scheme level gap analysis was conducted covering 76 schemes across 9 packages to study the level on which data is collected using MIS.

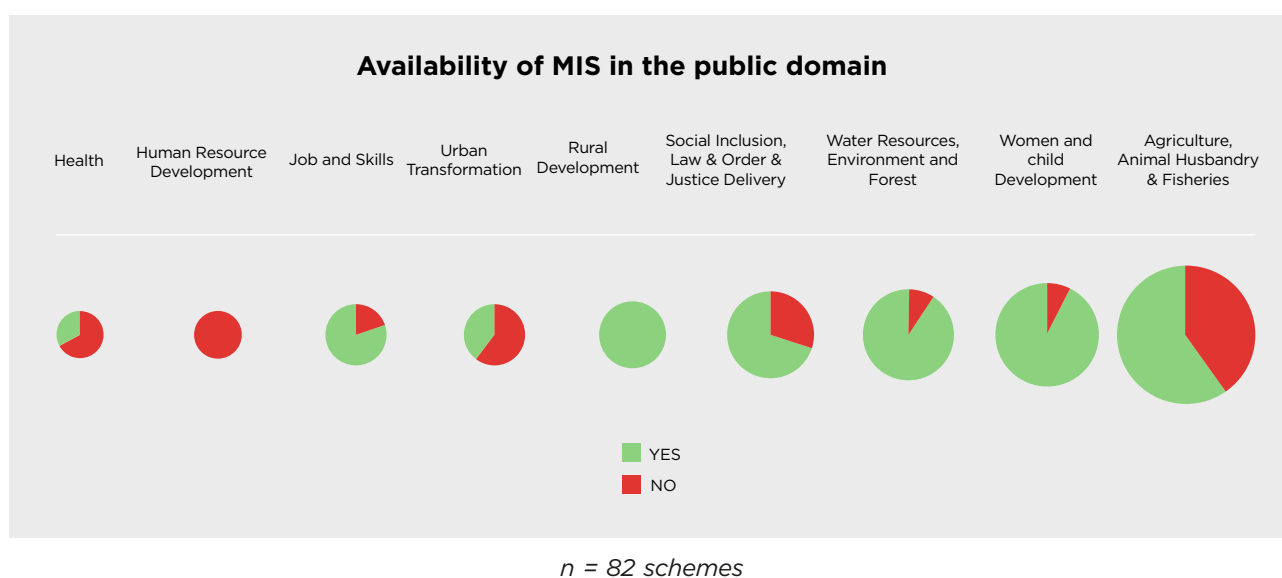


Figure 12: Sector-wise availability of online scheme MIS

At a scheme level, it was found that **70.7%** of the schemes had scheme MIS available in the public domain (58 out of 82 schemes). The remaining 29.3% of the schemes had a log-in id and password for their MIS portals.

A sector level analysis (See Figure 12) revealed that the Rural Development sector performed exceptionally well as they had all 6 schemes MIS available in the public domain. Water Resources, Environment and Forest was another sector that performed well as they had 10 scheme MIS in the public domain. Agriculture, Animal Husbandry and Fisheries sector had 60% of the scheme MIS available on the public domain. Sectors such as Health; Urban Transformation; Human Resource Development fared poorly with respect to making schemes MIS available in the public domain.

2. User friendliness of IT-enabled mechanisms

The user-friendliness of IT-enabled systems is a key factor in driving the adoption of the IT tools/platforms. There are few key qualities that a good user-centric design holds. Sharp learning curve, high efficiency, high memorability and pleasant website design are few components of a good user interface (GRANICUS, 2022).

Case Study 6: Kaushal Panjee - Web/Mobile based mobilization tool

Introduction:

In 2017, the Kaushal Panjee was launched by Department of Rural Development (DoRD) to assist DAY-NRLM programmes in mobilising rural youth candidates. It was designed as a citizen-centric end-to-end tool to register the poor rural youth interested in skilling for wage/self-employment and to upgrade under Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) and Rural Self Employment Training Institutes (RSETIs). Kaushal Panjee was made available in the public domain through a mobile App and through the Web Portal, which is used by candidates, employers, trainers, Project Implementation Agencies (PIAs), RSETIs, SRLMs, and by DoRD.

Background to the intervention:

Kaushal Panjee aims at mobilising the rural youth through a structured web/mobile based tool. It relies on six features to ensure that DDU-GKY and RSETI can reach and register candidates, and all stakeholders involved in the process have full access to their information. The features of Kaushal Panjee are Candidate Management, Employer Registration and Management, PIA/RSETI Dashboard, Trainer Registration & Management, SRLM Dashboard and Media Gallery, Helpdesk and Dynamic Reporting Module. The information available is captured and maintained in a saturation approach through Gram Panchayats. Since its inception, Kaushal Panjee uses Socio Economic and Caste Census (SECC) data in the process of identification of beneficiaries, which allowed the rural youth in villages and remote areas to be easily reached and registered under DDU-GKY and postings and Placements.

Details of the intervention:

Through Kaushal Panjee system, the rural youth can be tracked by the government, Citizens and the business community to provide skilling and employment. At the government level, the tool works as a centralized repository of candidates, in which eligibility is validated through the system itself. It also provides the updated status of candidates regarding skilling, placement, assessment and certification in a State disaggregated manner. At the citizen level, advantages include instant online registration and application in sector/trade wise disaggregated opportunities in the nearest training centres. In addition, the rural youth can refer family and friends to join DDU-GKY or RSETI through the app/web portal. Finally, the business community can upload opportunities in the system, which then generates a list of potential candidates for placements according to the criteria inserted. Likewise, training partners and PIAs can digitally shortlist and approach candidates for training according to demographics.

Impact:

Kaushal Panjee has been implemented in all States and UTs in India, covering 689 Districts and 7,426 blocks. So far, 22 lakh candidates have been registered and 2.6 lakh have taken part in DDU-GKY across its 1,700 training centres. Trainings were conducted across the country under 1,587 projects in partnership with over 724 PIAs in 50 sectors, securing more than 600 job roles until the end of FY 2019-20. Currently, more than 500 trainers are registered monthly in the system, with several receiving offers from PIAs. Likewise, over 4,000 jobs were posted by more than 110 employers to date. In the short span since its launch, Kaushal Panjee has won important awards for its achievements. They include the Gold Award and the Award of Merit of the SKOCH Awards 2018, and the Digital Transformation Awards 2019, both in skill-related categories.

One of the important aspects to consider while designing any IT application is to understand the general technology know-how of the end beneficiary. Based on this understanding, the designers would need to think on lines of making the application workflows simple, effective and available.

Further, it is also equally important to incorporate design theory aspects into the IT tools developed. Using more visuals than text, decluttering the application front end to allow users to easily gather the action to be performed, making content available in local languages, allowing access through different platforms like mobile phones, laptops, etc are some design aspects that are incorporated in a good design.

i. User friendliness of Websites

Acknowledging the need for all websites developed by the Government of India (GoI) to conform to a minimum national standard of citizen centricity, security and user friendliness, NIC developed the Guidelines for Indian Government Websites (GIGW). The guidelines, launched in 2009 and revised in 2019, have been formulated in accordance with internationally accepted standards and aim to make Indian government websites conform to the UUU trilogy, i.e., usable, user-centric and universally accessible. 27 out of the 57 guidelines listed under the GIGW compliance matrix are related to maintaining standards of accessibility, content, and design while the remaining focus on aspects such as security, maintenance, departmental preparedness and portal development. An online portal has also been developed with all relevant tools, resources, and list of frequently asked questions in order to assist the government department in implementation of the GIGW guidelines (Guidelines for Indian Government Websites, 2022). On the basis of these guidelines, the Standardisation Testing and Quality Certification (STQC) provides a Website Quality Certification to the websites.

From the 20 M/Ds (See Table 1) that are assessed under the scope of this study, **GIGW compliance certification is valid for 6 M/Ds**, has **expired for 12 M/Ds** and **is not available for 2 M/Ds** (STQC, 2021).

Table 1: GIGW Compliance Certification Validity of Ministry/Department Websites
(as on 12th August 2021)

Sno	Ministry/Department	Certificate Status
1	Department of Rural Development	Expired
2	Ministry of Skill Development and Entrepreneurship	Not available
3	Ministry of Labour and Employment	Expired
4	Department of Social Justice & Empowerment	Valid
5	Ministry of Housing and Urban Affairs	Expired
6	Department of Agriculture Cooperation and Farmer's Welfare	Expired
7	Department of Animal Husbandry & Dairying	Expired
8	Department of Fisheries	Expired
9	Department of Water Resources, River Development and Ganga Rejuvenation	Valid

Sno	Ministry/Department	Certificate Status
10	Department of Land Resources	Valid
11	Ministry of Minority Affairs	Expired
12	Department of Justice	Expired
13	Department of School Education and Literacy	Valid
14	Department of Higher Education	Not available
15	Ministry of Woman and Child Development	Expired
16	Department of Health and Family Welfare	Expired
17	Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH)	Expired
18	Ministry of Environment, Forests and Climate Change	Expired
19	Ministry of Tribal Affairs	Valid
20	Ministry of Home Affairs	Valid

ii. **User friendliness of IT tools for data collection, analysis and service delivery**

While websites act as the face of information and service delivery to citizens by the government, it is also important to ensure that IT tools used for other activities like **data collection/entry and data analysis must also be intuitive and easy to use** by the data collecting/entry operator and the policy makers making data-driven decisions respectively.

Case Study 7: Bhubaneswar's Common Payment Card (DMEO, 2021)

Bhubaneswar Smart City Ltd. along with ICICI Bank has developed a Common Payment Card System (CPCS). 'Odyssey' city card, is a unique offering that enables residents to make quick and easy payments for an array of services at different points-of-sale, such as – public transportation systems, municipal bill payments, utility payments, parking, retail, recreation, amusement and other payments within the area of Bhubaneswar Municipal Corporation. This project has been implemented under Build, Operate, Manage and Transfer mode.

Implementation in practice:

CPCS provides safe digital monetary transactions reducing citizens' dependence on cash for transactions. 5 lakh such cards are being disbursed through 325 point-of-sale machines maintained at a grid of 500 metres in the city. This system is expected to be the mainstay for the city's digital payments ecosystem. Users can recharge their card by either paying cash at the designated counters or digitally through the online customer portal. Revenue sources for the concessionaire include rights towards cost recovery and advertising rights on the smart card, as well as 10% revenue share from transaction charges from non-municipal payments.



What is unique is that one does not require bank account opening to avail this card, can be used on regional buses as well, and can be linked to various government incentive programmes too. The card can be recharged by Unified Payments Interface (UPI)/online portal or cash top-up which is available at all listed outlets and BRTS stations. The issuance fee for personalised card is Rs. 75, while that for a non-personalised card is Rs. 50.

Outcomes:

By August 2020, around 16,000 such multi-utility cards have been issued.

Lessons Learnt:

Prepaid multipurpose common mobility cards like Odyssey Card enable cashless transactions across multiple fronts. It is an excellent example of how civic authorities along with private participation can together enable create a city-wide ecosystem of digital payments.

3. Dissemination of information through Website/s

Government uses ICT for disseminating information through different modes. One of the most used methods by M/Ds to disseminate information is through websites. Websites of M/D provide relevant information in an effective and efficient manner which encourages the users to access the sites which also ensure maximum reach of government information and services to citizens of India. While understanding the importance of dissemination of the information to the wider audience, government has also formulated the guidelines for Indian Government websites which are in accordance with the internationally accepted standards to ensure that websites are secured, easy to maintain, user friendly and also accounts for factor like consistency and uniformity across the government web space (DARPG, 2018).

National Portal of India is an official single-entry portal which aggregates all Indian government websites in a single window. It's source for access to all the information and services provided by the Indian government to its stakeholders and citizens and also acts as a gateway to a plethora of information and services provided electronically by the different departments of Indian Government.

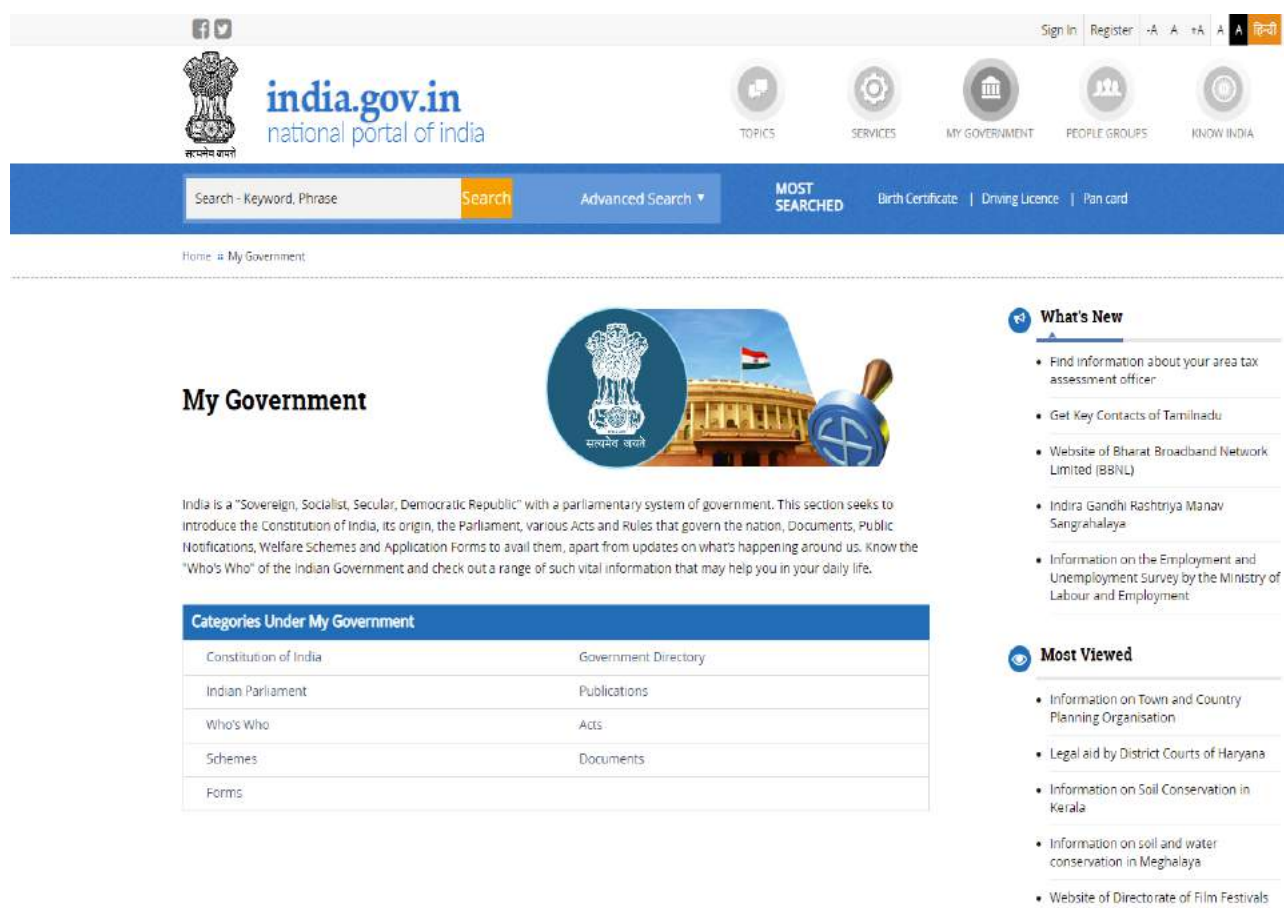


Figure 13: Landing page of the National Portal of India

4. Dissemination of information and services through mobile applications

With the widespread use of mobile phones in the country, particularly in rural areas, it has become necessary to provide government services via mobile devices in order to realise the vision of the National e-Government Plan (NeGP), which is to bring government services to citizens' doorsteps.

To take this vision from dream to reality, GoI launched the 'Mobile Seva' initiative aimed at mainstreaming mobile governance in the country. It provides a unified platform for all government departments in the country for delivery of public services to the beneficiaries/citizens over mobile phones through various gateways such as SMS, IVRS, location-based services, mobile applications etc (The National Mobile Governance Initiative, 2022).

Some major gateways and their application areas are enlisted below:

- i. SMS: The SMS gateway allows e-Governance exchange with a unified SMS service to deliver SMSs to all residents and enterprises. The gateway not only allows the government to push common informational services to citizens as a group, but also allows citizens to request specific information through SMS services.
- ii. Interactive Voice Response System (IVRS): The IVRS application is designed to support C2G and G2C services by automating status inquiries and delivery of necessary information to service seekers for a large number of services.

- iii. Location Based Services (LBS): LBS are used by the government to customize services according to the geographical location of the service seeker. Some of the popular ways to determine the location information of the service seeker are (Global Positioning System) GPS and cell tower location information.
- iv. Mobile Applications: Various government departments host mobile applications on Mobile Seva App Store (<https://apps.mgov.gov.in>) which the citizen can download and use to avail various government services anytime and from anywhere.

Case Study 8: Usage of Quick Response (QR) Code enabled Curriculum for Mobile based Teaching (DMEO, 2020)

Summary:

In order enable technology embedded teaching systems to improve teaching efficiency and to improve learning experience for students in Government Schools in Maharashtra, Balbharti, the Maharashtra State Bureau of Textbook Production and Curriculum Research developed the innovative e-Balbharti application which can be accessed through a QR code in the textbooks

Objectives and Rationale:

The objective of the initiative was to improve the overall learning experience of students in government schools by supporting technology enabled pedagogy. The e-Balbharti App is a mobile application containing a repository of digital content including e-content, e-textbooks, puzzles, games, etc. that can be used by teachers who have smartphones

Key Stakeholders:

The initiative was implemented by Balbharti, the Maharashtra State Bureau of Textbook Production and Curriculum Research, with the support of government school teachers across various districts.

Implementation Strategy:

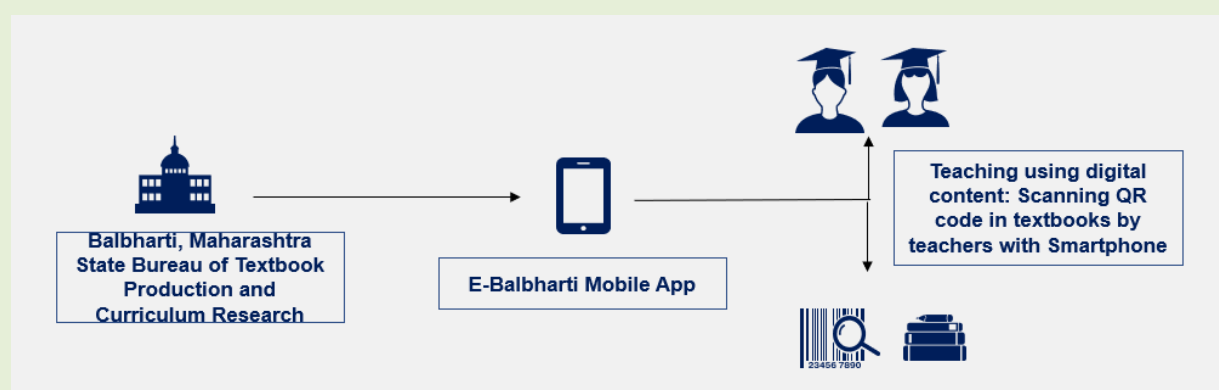


Figure 14: Implementation strategy

Resource Utilization:

The application was developed in house with minimal financial resource utilization, with primary investment being incurred on the mobile application development.

Impact:

The application witnessed nearly 24,000 downloads within 3 months, at over 150 downloads every day.

Key Challenges and Lessons Learnt:

A critical challenge foreseen was availability of smartphones with teachers. However, the overall initiative experienced widespread acceptance amongst students and teachers.

Replicability and Sustainability:

While the initiative was initially introduced for class 8, it was progressively scaled to include classes from 1 to 8.

To understand the number of mobile applications hosted by Gol, the information on the Mobile Seva App Store was analysed. There are 984 total live apps on the store and the store has recorded a total of around 8.7 crore downloads.

Analysing the state-wise breakup (See Figure 15), it is observed that the **highest number of mobile apps are hosted by Maharashtra (23), followed by Punjab (19), Andhra Pradesh (16), Himachal Pradesh (16), Rajasthan (14) and West Bengal (14).**

The **number of app downloads is high (more than 1 lakh) in Uttar Pradesh, Jharkhand, Andhra Pradesh, Punjab, Maharashtra, and Rajasthan** (See Figure 16).

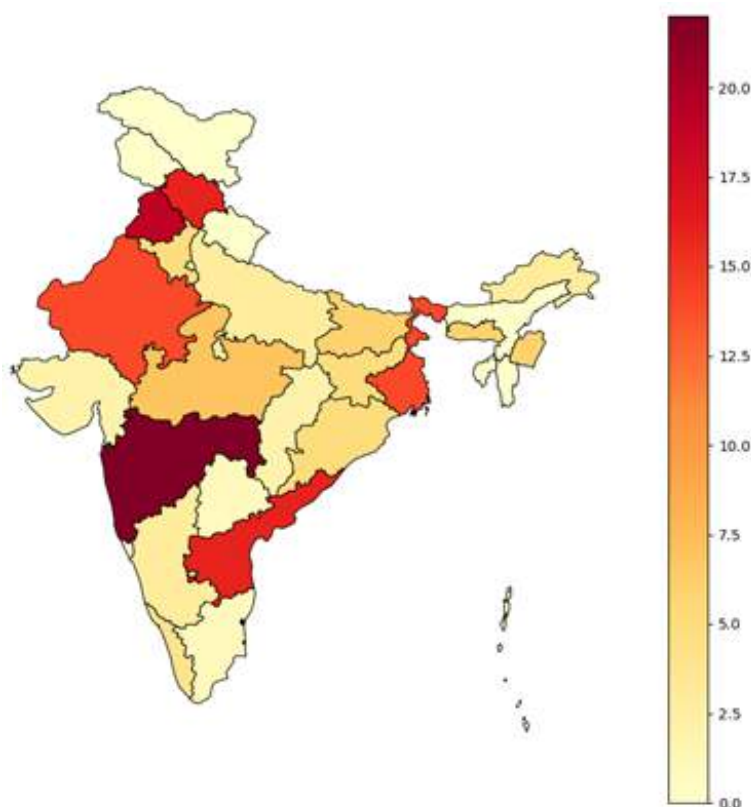


Figure 15: State-wise number of mobile apps hosted on the Mobile SeVa App store (Mobile SeVa AppStore, 2021)

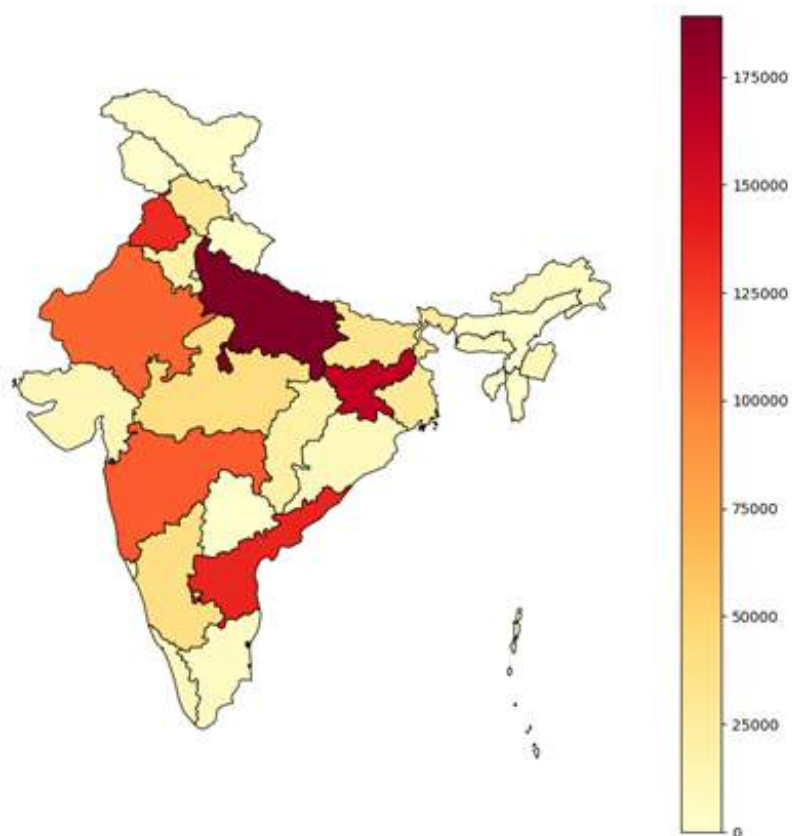


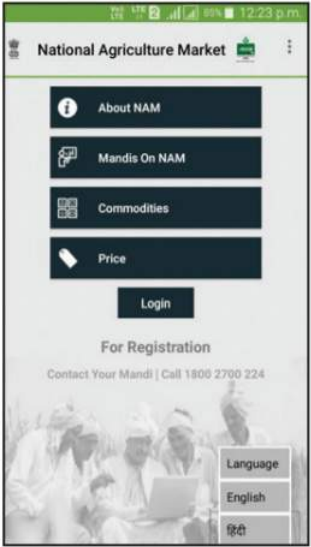
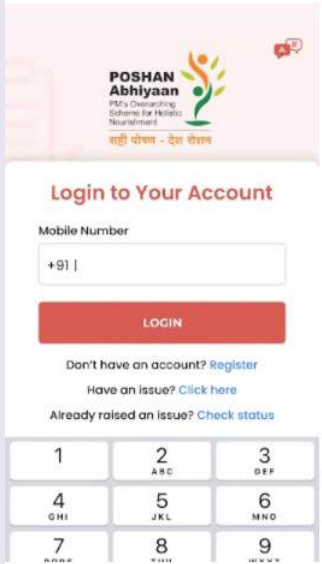
Figure 16: State-wise number of mobile app downloads from the Mobile SeVa App store (Mobile Seva AppStore, 2021)

Out of the total services (984) hosted on the mobile seva app, 479 applications are hosted by the central government. These include general applications as well as scheme specific applications.

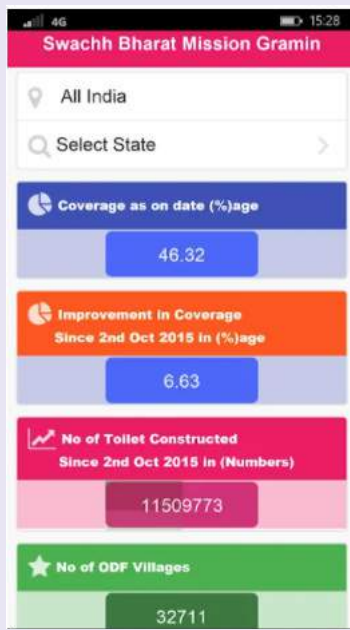
Table 2: Key mobile apps launched by the Government of India

Key mobile apps launched by the Government of India (scheme specific applications)		
Umang	The Umang mobile app aims to provide easy access to a plethora of Indian government services on a single platform. Number of services listed on the app: 21,882 Number of Departments whose services are listed on the app: 271 (137 Central, 134 State) (Umang, 2022)	

Key mobile apps launched by the Government of India (scheme specific applications)

eNAM Mobile App	The eNAM mobile app aims to make bidding easier for traders on the National Agriculture Market (NAM) and provide farmers and other stakeholders with access to arrivals and price-related information via their smartphones. Scheme: Integrated Scheme for Agricultural Marketing (ISAM) Sector: Agriculture (MANAGE, 2017)	
Poshan Tracker	The Prime Minister's Overarching Scheme for Holistic Nutrition (POSHAN) Tracker app gives a 360-degree view of Anganwadi Centre (AWC) operations, Anganwadi Workers (AWW) service deliveries, and complete beneficiary management for pregnant women, breastfeeding moms, children, adolescent girls, and teenage males. All AWCs, AWWs, and beneficiaries can be monitored and tracked in real time using the designed system (Poshan Tracker, 2022). Scheme: POSHAN Abhiyaan Sector: Women and Child Development	
Ayush Sanjivani	The mobile application is launched to spread awareness and understanding amongst the citizens of the measures for enhancing immunity and maintaining health during the COVID-19 pandemic. Scheme: National AYUSH Mission Sector: Health	

Key mobile apps launched by the Government of India (scheme specific applications)

SwachhApp	The app tracks the present sanitation status up to the village level along with details of beneficiaries. The app has the provision to upload photographs of toilets. Further, the app is also being used to rate the villages based on their cleanliness status and the Solid and Liquid Waste Management (SLWM) index developed by the Ministry of Drinking Water and Sanitation. Grievance redressal and citizen information services are also available for citizens through the application (Wash 4 Work, n.d.). Scheme: Swachh Bharat Mission (Gramin) Sector: Rural Development	 The screenshot shows the Swachh Bharat Mission Gramin app interface. It includes a location selector set to 'All India', a 'Select State' dropdown, and several data cards: 'Coverage as on date (%)' at 46.32, 'Improvement in Coverage Since 2nd Oct 2015 in (%)' at 6.63, 'No of Toilet Constructed Since 2nd Oct 2015 in (Numbers)' at 11509773, and 'No of ODF Villages' at 32711.
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Case Study 9: Jabalpur's mobile app for citizen's accountability (DMEO, 2021)

Jabalpur Municipal Corporation sought to make civic services easily accessible for its increasing population. To address this, Jabalpur Smart City has launched a citizen centric mobile app (Jabalpur311) to enable citizens access a range of civic services using their smartphone. This is a one-stop solution to manage, supervise and regularise cities, using smart phones (compatible with both Android and iPhone). The app is designed for the convenience of citizens as well as the officers of the Corporation regarding various day-to-day government information tasks. Using Jabalpur 311 app citizens can directly avail the facilities and services from the Corporation through their mobiles. The app contains an administrative module namely Smart City 311 for the Corporation Officers.

Implementation in practice:

This mobile app enables online application, tracking and service request fulfilment for services such as - birth and death certificates, payment of property tax, water bill, building plan approval, applying for ration card, police helpline, ambulance service, request for water tanker, booking a community hall, helpline for women, children and senior citizens. Apart from these real time traffic conditions and parking information, etc. can also be tracked through the app. Developed at a cost of around Rs. 1 crore, this app is a pioneer in m-Governance services and being accountable towards citizens. The prime objectives are:

- Helpdesk facility to contact all the emergency contact numbers.
- Availing the online services for the various facilities/ activities available under the Corporation.
- Real time data related to city traffic for best route options leads to saving of time.

- Facilitate services available in nearby localities.
- Facilitate logging of complaints and taking feedbacks and suggestions for the advancements and betterment of the localities.
- Integration with the social networking modes to make available the facility of contacting also through such medium.
- Users can lodge complaints regarding water supply, electricity, garbage collection, streets, encroachments, etc. and can also provide suggestions on various government schemes.
- Nearby services information is available for public toilets, police stations, bus stand, taxi stand, hospitals, 24x7 pharmacy stores, schools, ATMs, registered plumbers /carpenters /contractors/ electricians, etc.



Figure 17: *Jabalpur's mobile app for citizen's accountability*

Using Smart city 311 administrative module the officers can track and monitor the status of various projects and could take necessary actions on them effectively as needed. This module further has sub-modules for field inspection, GPS based attendance, GPS based road checking, project tracking, work-flow management system and a central support system for logging complaints and monitoring the resolution via window ticketing management.

Outcomes:

As of September 2020, this application has been downloaded by more than 10,000 citizens. The grievance resolution rate has been more than 90 per cent.

Lessons Learnt:

Simple steps towards citizen accountability like launching a mobile application for service requests and grievance redressal are easily replicable solutions.

DIMENSION III: DATA QUALITY ASSURANCE

Data quality assurance is a process of identification & elimination of data anomalies via statistically evaluating data through data profiling and cleansing. The key areas covered under this dimension relate to profiling of data, data quality assessment processes, data cleaning and use of latest technologies in the process.

Case Study 10: Using Technology to Improve Government Payments (DMEQ, 2020)

Biometrically authenticated payment systems can reduce corruption and substantially improve the delivery government payments. However, it is important to have visibility over beneficiary experience and design reforms keeping in mind last mile delivery challenges.

- In a randomized evaluation of a biometric payments system in Andhra Pradesh, the technology reform of linking payments to biometric smartcards increased the payments that beneficiaries received without decreasing programme expenditure, showing a reduction in leakage.
- An organizational reform where payment logistics were contracted to private banks and customer service providers (CSP) in each village reduced delays and unpredictability in payments. The presence of CSPs ensured ease of access to payments.
- Further, the Government of Andhra Pradesh did not make the biometric technology mandatory, so that beneficiaries who could not enrol could still receive payments. Gradual implementation and incentives for implementers can align key stakeholder interests and mitigate the challenges of payment system reforms.

Providing monitoring information in an accessible and actionable format to government officials can reduce payment delays and improve implementation of social programmes.

- In a study in the context of MGNREGS, government officials were trained to use PayDash, a mobile-based monitoring platform, which generated real time information on payment delays linked to employees responsible for each administrative step. The study found that providing easily accessible monitoring data to officials who are in a position to act on it significantly reduced wage payment delays in areas with worse baseline performance.
- In a study in the context of the Rythu Bandhu Scheme in Telangana, officials responsible for distribution of checks were informed of a phone-based monitoring system which surveyed beneficiaries via phone and generated report cards on the officials' performance. The knowledge of a monitoring system improved check encashment rates and on-time delivery of checks.

1. Use of geo-tagging and geo-tagged photographs in case a scheme creates physical assets.

The technique of assigning location information to various media types such as images, videos, and communications is known as geotagging. This media can be easily displayed on an online map or cross-referenced with other information about the area or location once it has been geo-tagged.

Geotagging is being adopted by Gol to:

- i. Track progress on development of physical assets
- ii. Assist in monitoring by providing a means to validate the physical asset development
- iii. Gain location-stamped feedback/grievances from beneficiaries/citizens on any physical asset

The benefits of geo-tagging are (World Bank, 2013):

- i. Cost-efficient and safe: The technology allows the project team to validate, monitor, and analyse actual progress on the ground without having to travel to difficult-to-reach locations or high-risk zones, saving them valuable people, time, and effort.
- ii. Easy reference: Donors, implementing agencies, contractors, and other partners can get essential information on the sub-projects, such as specific locations, dates of operation, land areas, distance covered, and where they are in relation to other landmarks in the area, thanks to the technology.
- iii. Transparent: It enables citizens to keep a closer eye on the bidding and procurement process. The GPS data generated in the system assigns each project a unique identification tag, preventing duplication and overlapping of infrastructure projects, as well as fraudulent projects and incorrect data reporting.

The first central government scheme that adopted geo-tagging was the MGNREGA to monitor the assets created under the scheme on a real-time basis (The Print, 2019). The necessity for geo-tagging came from the observation that the assets created under the programme were not long-lasting, resulting in the creation of the same asset over and over. Since then, geo-tagging has been adopted by multiple schemes.

With the vision to enhance planning and monitoring through geo-spatial data, ISRO launched the national Geo-portal of India in 2009, BHUVAN. Since its launch, the Bhuvan portal has enabled various government departments to host their geospatial data in the public domain as information layers for the purposes of visualisation and analysis. Currently, the Bhuvan portal hosts more than 20 ministry portals and 30 state portals in addition to providing support for the government's flagship programmes such as Integrated Watershed Development Program, National Mission for Clean Ganga, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), etc (ISRO, 2022).

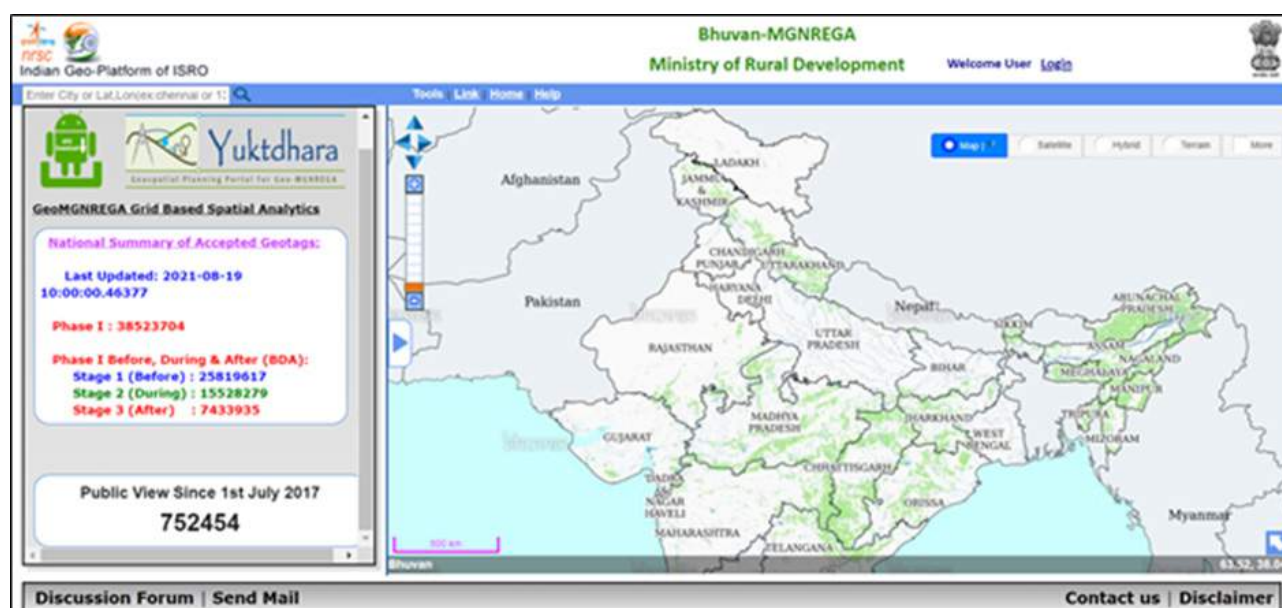


Figure 18: Bhuvan-MGNREGA Portal (Mobile based geo-tagging application)

Case Study 11: Unmanned Aerial Vehicles (UAV) for GIS integration (DMEQ, 2021)

Introduction:

Formulation of GIS based Master/Development Plans is one of the important reforms under AMRUT. The objective of this reform is to develop common digital geo-referenced base maps and land use maps using GIS and master plan formulation for all cities under AMRUT scheme. However, small and medium towns have limited capacity for formulating master plans by using conventional GIS technology and therefore Ministry wanted to explore UAV technology for formulation of GIS based masterplan of these towns. In this endeavour, a committee for framing Design & Standards for application of UAV Technology for formulation of GIS based Master Plans for small and medium towns was constituted under the Chairmanship of Surveyor General of India (*vide order no. K-14031/5/2016-AMRUT(CB)-Part (2) dated 26 September 2018*).



Figure 19: Unmanned Aerial Vehicle (DMEQ, 2021)

Implementation in Practice:

UAVs are increasingly being used for GIS integration and local area planning, especially in difficult terrains, owing to many advantages. A UAV, commonly known as a drone, is an aircraft without a human pilot onboard. It may operate either under remote control by an operator or autonomously by on board computers. North Eastern Space Applications Centre has done more than 80 UAV surveys for different users in the North Eastern region. This UAV technology is not only used for formulating the GIS based master plan but also used in many other sectors such as construction of highways, railways, and power & utility projects, in agriculture, mining and in disaster management. Some of the examples of UAV technology are presented below.

- An autonomous agency of the GoI, responsible for management of a network of National Highways has employed the use of drones for 3D digital mapping for Detailed Project Report (DPR) preparation of road widening for Raebareli – Allahabad Highway. Data collected is being utilized for calculation of compensation of landowners with property rights along the highway.
- National Railway System is planning to use drones to monitor the construction of its railway lines by 3-D mapping of dedicated freight corridor network of 3,360 Km project (at bid planning stage). The entire corridor will be mapped using UAV technology.

- An Indian state-owned electric utilities company has obtained approval and started working towards implementing UAV for project monitoring in hilly terrains. The primary reason for Power Grid Corporation of India Limited (PGCIL) investing in deploying UAV is its cost efficiency.
- An agency for coordinating response to natural or man-made disasters has deployed UAS for rescue and relief operations (locating of trapped citizens, providing relief packages etc).

Result/Impact:

Based on the specifications, UAVs can provide very high spatial resolution (up to 5-10cm/px) and help in 3D modelling. These operations are not affected by cloud coverage and are able to deliver high temporal resolution. The imagery obtained from UAVs can immensely support in many applications ranging from large-scale land mapping, urban modelling to vegetation structure mapping along with real time assessment and project monitoring activities under various applications. Furthermore, the technology is affordable and can be customized based on project requirements against few limitations.

Lessons learnt:

AMRUT has recognized the importance of application of advanced technology such as UAVs for GIS integration for formulating land use-based plan in small and medium towns. This advanced technology along with proactive government decision for adopting the technology and formulation of standard guideline for preparing master plan by using UAVs are major success factors for achieving the objective of reforms under AMRUT scheme.

From the CSS reports, it is found that (See Figure 20) out of the 81 schemes for which geo-tagging application is a possibility, **46 schemes are using geo-tagging**.

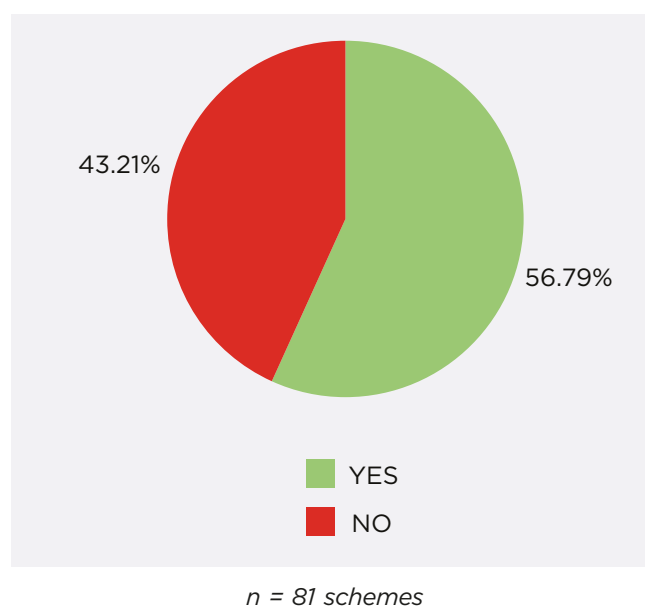


Figure 20: Percentage of use of geo-tagging in the schemes

Case Study 12: Use of Web Portal and Mobile Application for Geotagging of Developmental Projects in Arunachal Pradesh (DMEO, 2021)

Introduction

In order to create a common platform for data sharing and to ensure transparency and accountability, the state government of Arunachal Pradesh made it mandatory to monitor progress of all Centrally Sponsored Schemes (CSSs) and state schemes through satellite-based monitoring and geotagging of development projects. This initiative was undertaken for periodical assessment of stages of developmental projects.

Intervention

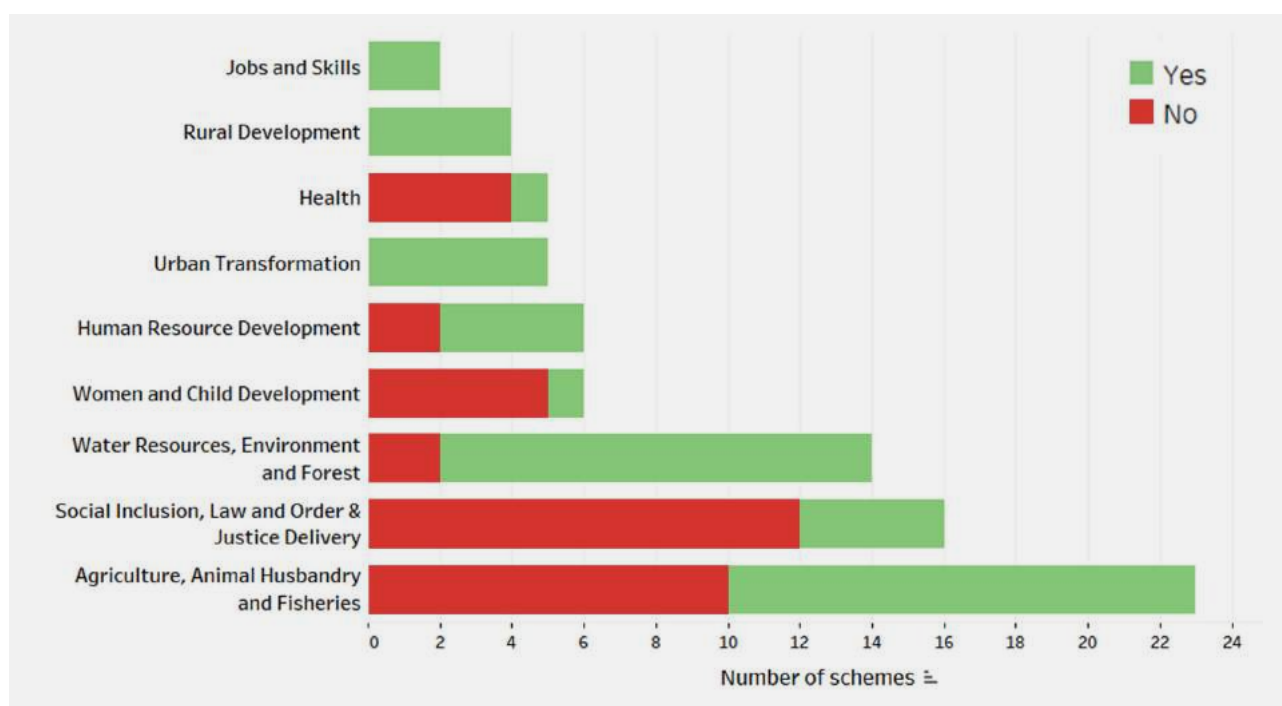
Geotagging is done before, during and after completion of projects, with photographic evidence, before funds are released under Pradhan Mantri Jan Vikas Karyakram (PMJVK). Arunachal Pradesh government has developed a monitoring application named, 'Arunachal Monitoring', which is used for geotagging and collecting photographic evidence. The data is collected and uploaded directly on the portal. Fifty per cent of the funds have been released for setting up of the app. For the release of the remaining 50 per cent funds, the districts have to submit photographic evidence of the projects by uploading them onto the portal. Later on, at the time of sanctioning of funds, the state department verify the status of projects through the photographic evidence uploaded on the portal. Hence, the projects are digitally monitored by the district level committee and the evidences collected are used for sanctioning of funds by the state department.

In order to ensure smooth implementation, the field officers were imparted training on procedures and report-generation mechanism. Also, field visits were undertaken for conducting practical training for geotagging of projects.

Impact

The initiative helped in strengthening the database and promoted ease in sharing data between the Centre and state. The state departments could constantly monitor the progress of developmental projects using satellite imagery and geotagged coordinates of work sites.

Based on CSS reports, it was found that all schemes under the rural development and urban transformation sectors where geo-tagging usage is applicable, are utilising geo-tagging. In Health, Women and Child Development, and Social Inclusion, Law & Order & Justice Delivery less than 50% of the schemes eligible for geo-tagging are utilising the technology (See Figure 21).



$n = 81$ schemes

Figure 21: Sector wise analysis on the use of geo-tagging for schemes where geo-tagging is eligible

Case Study 13: Geo-tagging through mAMRUT app (DMEO, 2021)

mAMRUT app has been developed by Ministry of Housing and Urban Affairs (MoHUA), with support from NIC, to facilitate ULB officials to capture GPS geo-tagged photographs of projects. The photographs are updated in AMRUT MIS portal and used for geo tagging each project on Geo Portal for Urban Mission developed by NIC (<http://geourbanmissions.gov.in/>). The online version of the app is access controlled and can be accessed by AMRUT nodal officer of each city. An offline version of the app is also available with free access to public. The following figure presents the interface of the mAMRUT app and the sample of geotagged photographs from Geo Portal for Urban Mission.

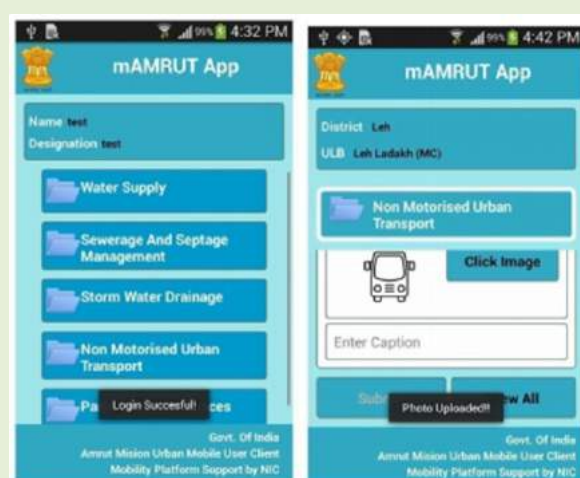


Figure 22: Interface of mAMRUT app for geo tagging

(Source: mAMRUT application for geo tagging)

It is noted that the website is user friendly and functional. It can be observed from the following screenshots that the website presents geo tagged projects for Swachh Bharat Mission – Urban (SBM-U), Pradhan Mantri Awas Yojana - Urban (PMAY-U), AMRUT, SCM, Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM) and Jal Shakti Abhiyaan.



Figure 23: Sample of a geo-tagged photograph of AMRUT project in Chennai

(Source: mAMRUT application for geo tagging)

The geo portal includes State, district, ULB wise filters along with filters for Scheme and component under the scheme. The geo portal indicated the locations of the projects along with the data on the number of projects in each State, City and ULB.

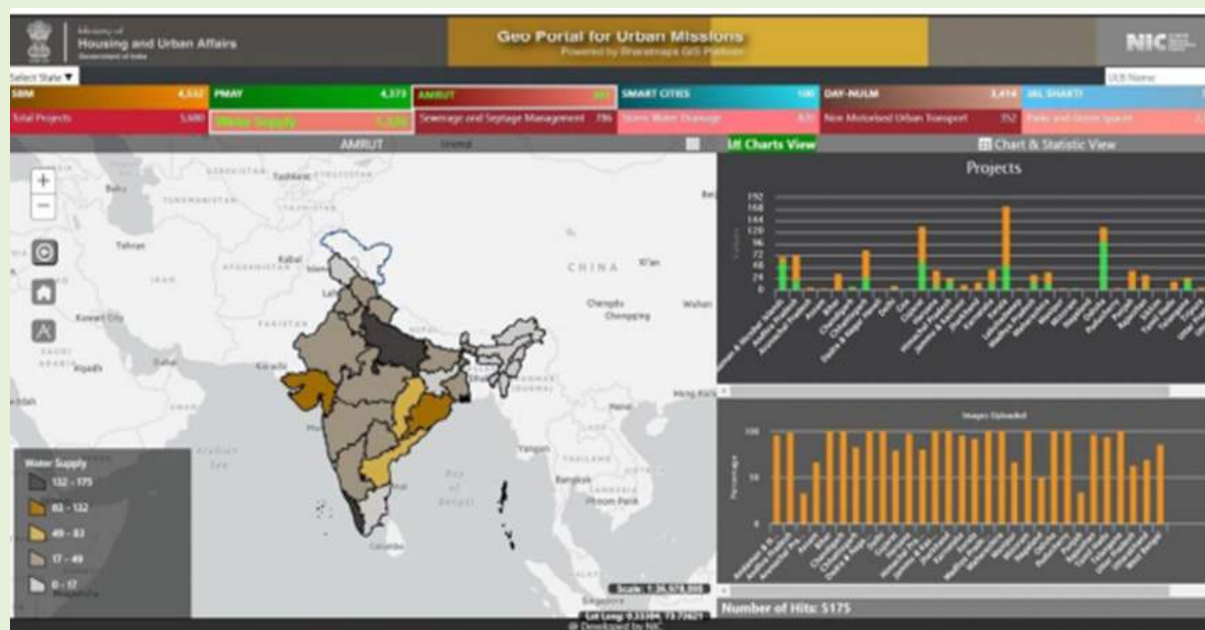


Figure 24: Dashboard for GeoPortal for Urban Missions

(Source: Geo Portal for Urban Missions)

2. Use of DBT and/or PFMS in case a scheme intends to directly benefit an individual beneficiary or an enterprise or a collective.

2.1. Usage of DBT

DBT was initiated by Gol on 1 Jan 2013 (Sengupta, n.d.). The aim was mainly to reform the government delivery system by restructuring the deep-rooted process which would help in faster flow of funds to the targeted beneficiaries. DBT replaced the Central Plan Scheme Monitoring System (CPSMS) which was the earlier avatar of the PFMS, for routing of the DBT. It came into effect to bring efficiency, effectiveness, transparency and accountability in the government system.

Fund transfer under DBT by Gol

The use of DBT by Gol for past three financial years (FY):

Table 3: Total Direct Benefit Transfer for past three FYs (Government of India, 2021)

	Total amount under DBT (In cr)	Total number of transactions (In cr)
FY 2019-20	381631	438
FY 2020-21	552527	603
FY 2021-22	115058	141

Over the past three financial years, there was an **increase of 44.7% in the disbursement of DBT from FY 2019-20 to FY 2020-21** and an **increase of 37.6% in the total number of transactions from FY 2019-20**. There is **an estimated financial gain of Rs 178396 cr.** by the government through usage of DBT (Government of India, 2021).

Types of Benefits covered under DBT

Gol includes all welfare/subsidy schemes which involve cash/kinds benefits transfer to all the individuals under DBT.

- i. Cash Transfer: This category embraces schemes or components of schemes wherein cash benefits are transferred by Government to individual beneficiaries. Following are the different routes through which cash benefits are transferred by M/D -
 - ❖ Directly to beneficiaries
 - ❖ Through State Treasury Account to beneficiaries
 - ❖ Through any Implementing Agency as appointed
 - ❖ Centre/State Governments to beneficiaries
- ii. In- Kind Transfer: This category includes schemes or components of schemes wherein kind benefits are given by the Government to individuals through an intermediate agency.

Table 4: Types of DBT transfers (Vikaspedia, 2022)

Type of benefit	Individual beneficiary schemes
Cash	MGNREGA, PAHAL, NSAP, Scholarships
Kind	Mid-day meals, PDS, SSA

The above table (See Table 4) mentions examples which depict different categories of schemes which can be grouped on the basis of the type of benefits to individual beneficiaries. The distribution of funds to the beneficiaries under DBT for different types of transfers can be seen as under (See Figure 25):

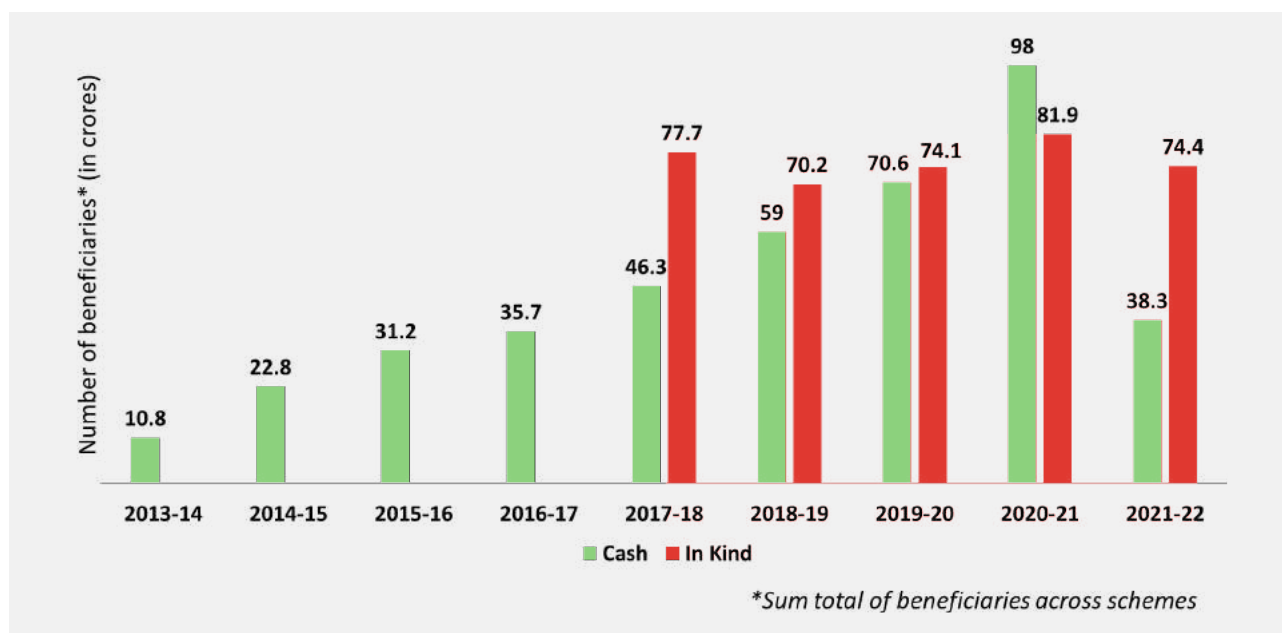


Figure 25: Year-wise DBT transfers to beneficiaries (Government of India, 2021)

Figure 25 above depicts that there was **only a single type of benefit (cash)** which was used for DBT transfer from FY 2013-14 to FY 2016-17. The Kind component in DBT transfer was introduced in FY 2017-18 and saw a **5 % increase from FY 2017-18 to FY 2020-21**. The Cash component in DBT for FY 2017-18 and saw a **significant increase of 111.6 % from FY 2017-18 to FY 2020-21**.

Table 5: Amount of funds transferred to beneficiaries for FY 2019-20 and FY 2020-21 under selected schemes (Bhattacharya S., Roy S.S., 2021)

Fiscal Year	2019-20		2020-21	
Programs	Funds transferred (Inr)	Number of beneficiaries	Funds transferred (Inr)	Number of beneficiaries
PAHAL	248219.1	262.8	226295.1	270.7
MGNREGS	460460.8	119.1	672182.9	139.3
NSAP	81144.8	34.6	72305.6	34.2
PMAY-G	438834.5	13.8	482511.5	18.4
Scholarships	70108.5	9.3	57462.4	7.8
Others (357 cash program)	1098523.2	265.9	11816116.4	332.17.6
Total	2397290.9	705.5	2692373.9	802.5

Table 5 highlights that cash transfer schemes are concentrated in five major national schemes. In 2020-21, **nearly 60% of all cash transfers beneficiaries belonged to 5 major schemes**. In 2019-2020, **62.4% of all DBT-cash transfer beneficiaries belonged to the same 5 schemes** as well. Moreover, in

2020-2021, nearly 60% of funds transferred as cash benefits directly to individual bank accounts were for these 5 schemes as well.

India's DBT Performance - Ranking of States

States have been ranked on a scale of 0 to 100 according to the usage of DBT (See Figure 26) as follows (Government of India, 2021).

- **Score of 0-20** – West Bengal
- **Score of 20-40** – Assam, Telangana, Lakshadweep, Arunachal Pradesh
- **Score of 40-60** – Dadra and Nagar haveli, Chandigarh, Andaman and Nicobar Islands, Meghalaya, Maharashtra, Karnataka, Sikkim, Nagaland, Punjab, Tamil Nadu, Delhi, Rajasthan, Andhra Pradesh, Manipur Kerala, Chhattisgarh
- **Score of 60-80** – Gujarat, Uttarakhand, Jharkhand, Goa, Jammu and Kashmir, Bihar, Madhya Pradesh, Puducherry, Odisha, Mizoram, Himachal Pradesh
- **Score of 80-100** – Haryana, Uttar Pradesh, Tripura

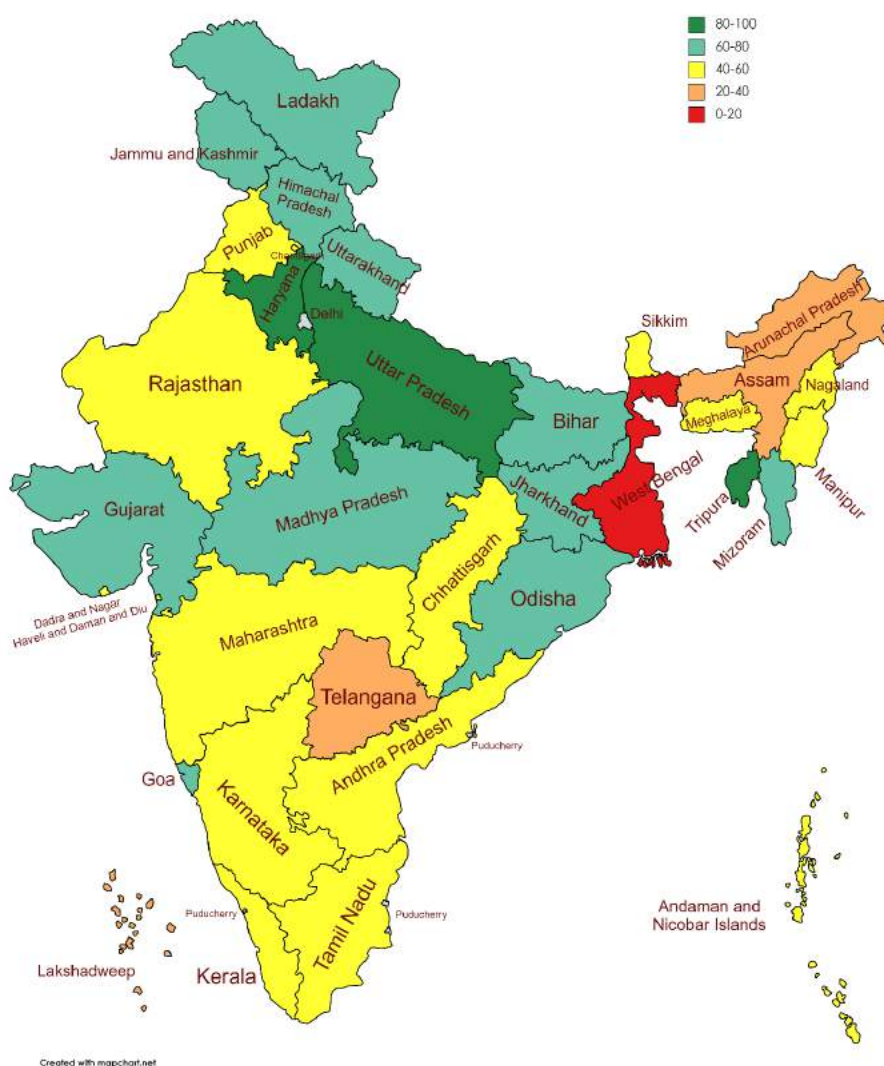


Figure 26: State wise score for the usage of DBT

Based on the scoring, following states are the top 3 and bottom 3 performers in DBT usage:

Top performers	Haryana, Uttar Pradesh, Tripura
Bottom performers	West Bengal, Assam, Telangana

India's DBT Performance - Ranking of M/Ds

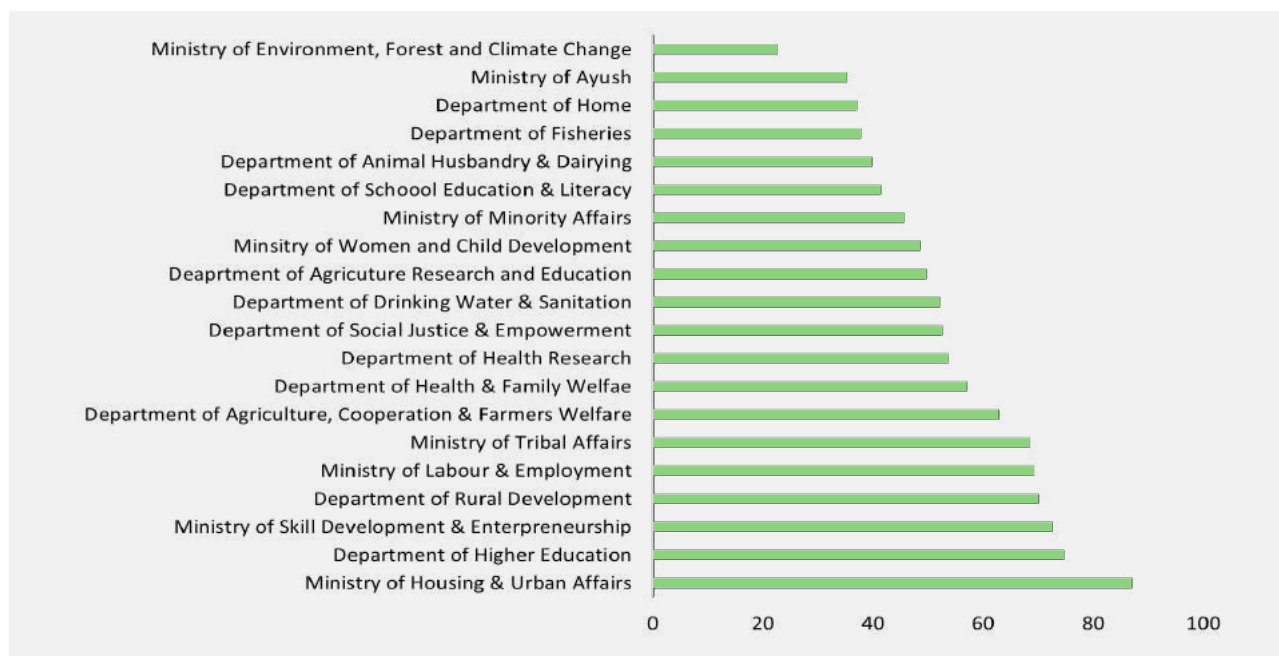


Figure 27: Ministry/Department wise ranking on usage of DBT

Figure 27 depicts that **Ministry of Housing and Urban Affairs, Department of Higher Education, and Ministry of Skill Development of Entrepreneurship are the front runners** in the usage of DBT. Whereas, **the Department of Home Affairs, Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy, and Ministry of Environment, Forest and Climate Change are the laggards** in terms of usage of DBT.

Based on CSS Evaluation report findings complemented by secondary research, the report has analysed the use of DBT across 9 sectors. The findings are presented below:

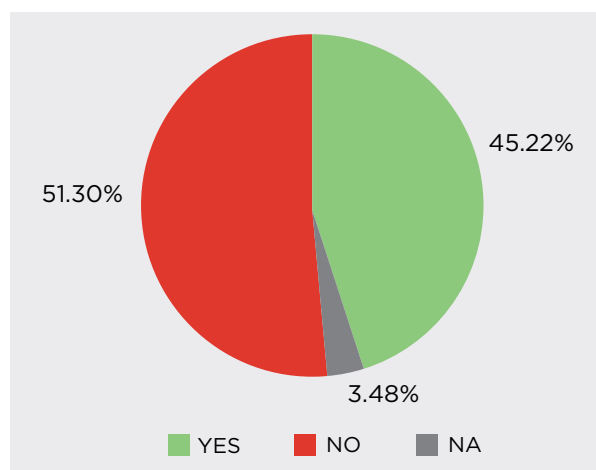
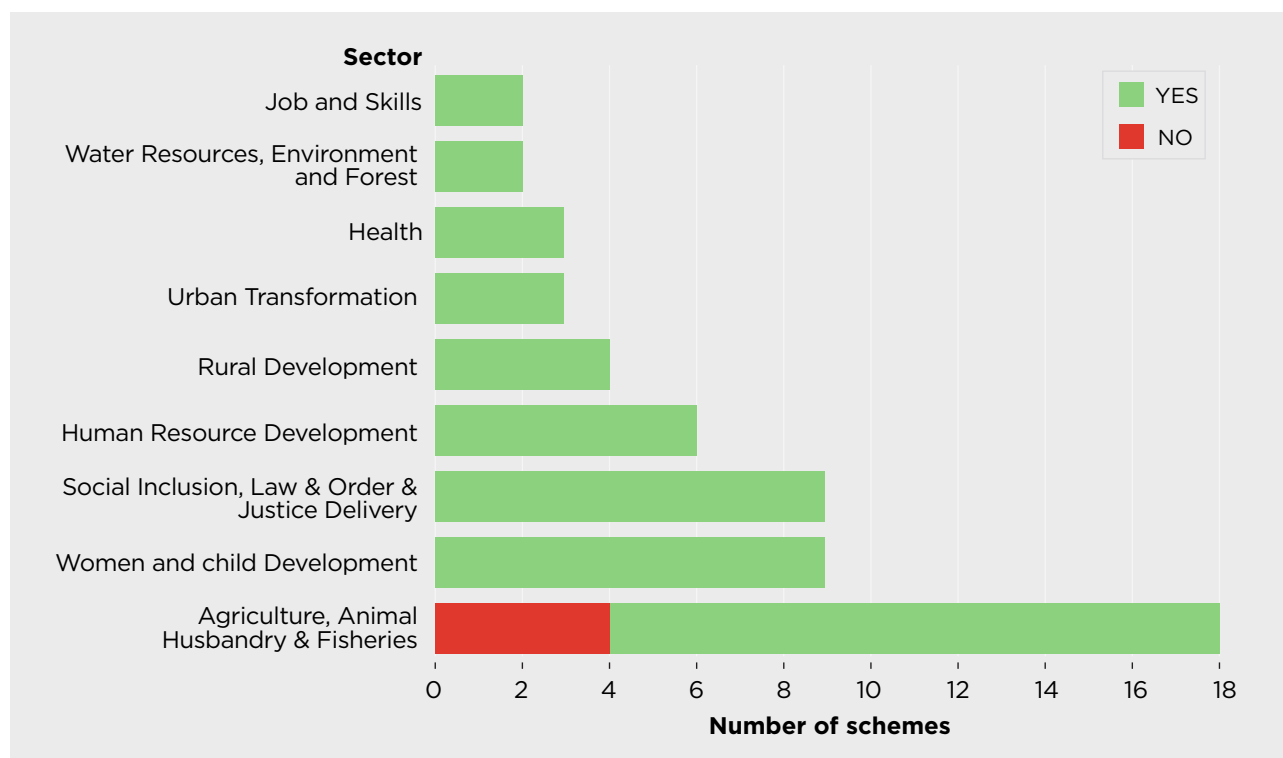


Figure 28: Percentage of use of DBT in schemes

It can be seen that **45% of the schemes use DBT** and **4% of the schemes have no provision of DBT** (See Figure 28).



n = 56 schemes

Figure 29: Sector wise analysis on the usage of DBT

It is found that (See Figure 29) 4 out of 18 schemes under Agriculture Animal husbandry and Fisheries sectors do not use DBT

2.2 Usage of PFMS

Based on CSS Evaluation report findings complemented by secondary research, the report has analysed the use of PFMS across 9 sectors. The findings are presented below:

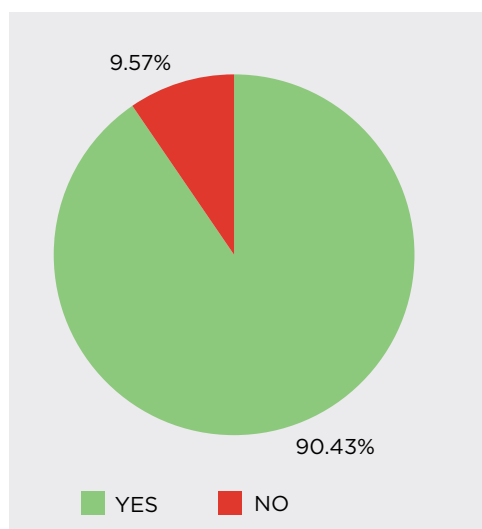


Figure 30: Percentage of use of PFMS in schemes

It can be seen that **90% of the schemes have a provision of PFMS** and **10% of the schemes do not use PFMS** (See Figure 30).

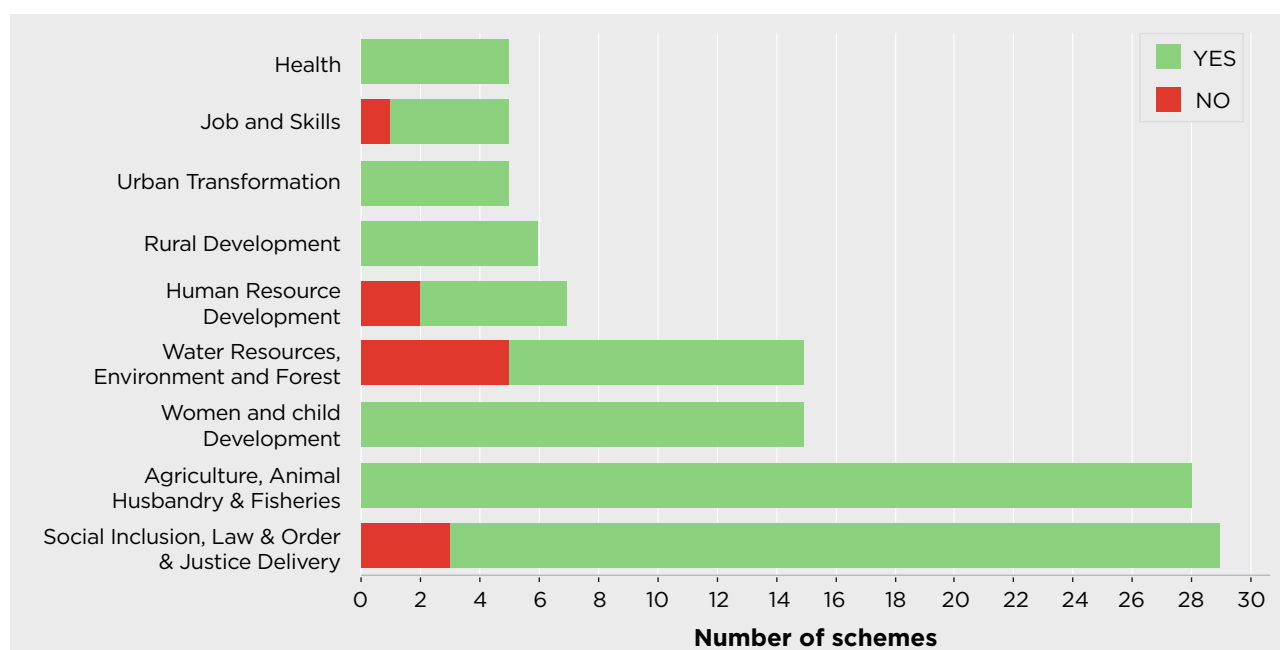


Figure 31: Sector wise analysis on the usage of PFMS

It was found that (See Figure 31) the Urban Transformation; Health; Rural Development; Agriculture, Animal Husbandry and Fisheries; and Women and Child Development sectors use PFMS for all the schemes. Whereas, the Social Inclusion, Law and Order & Justice; Water Resources, Environment & Forest; and Human Resources Development do not have a provision for PFMS for 3, 5 and 2 schemes respectively.

Case Study 14: Direct Benefit Transfer Portal: Improvement of Service Delivery for Scheduled Tribes (STs) through IT (DME0, 2021)

Integration of Universities with the Fellowship Portal:

To reduce process overhead and gaps, the universities have been integrated with the fellowship portal by utilizing the “Verification Module”. The registered nodal officer of the university can access documents available through Digi-Locker and process the applications digitally by issuance of approval or rejection. Through this integration, Ministry of Tribal Affairs (MoTA) can regularly monitor the up-to-date process of verification and grievance redressal. Additionally, timely verification has resulted in MoTA disbursing the scholarships in the same academic year to the eligible students. This module integration has benefited 4,794 scholars pursuing fellowship programmes across 331 universities.

Digi-Locker Integration:

The application form requires the prospective students to upload documentation pertaining to Aadhaar, income, caste, marksheets etc. as required by MoTA and the respective institutes. Both the fellowships as well as the overseas portals have been integrated with Digi-Locker. Additionally, the students can upload documents that are not available on Digi-Locker.

Aadhaar Authentication:

The DBT mission mandates the capturing of beneficiary details through Aadhaar authentication for all central sector schemes. The Aadhaar capturing allows the tracking of a student's lifecycle from pre-matric to Ph.D., while capturing information about the scholarships that they have opted for, drop-out rates as well as tracking those utilizing multiple schemes for their benefit.

Introduction:

To address the gaps that exist in educational status of STs, MoTA operates dedicated schemes to provide educational and livelihood opportunities for the ST community. These schemes, especially the scholarship schemes, provide the underprivileged access to quality education from pre-matric to post-matric stage as well as to higher-level education. However, the implementation of these schemes, owing to their hitherto largely analogue nature, presented difficulties to the Ministry in terms of assessing their effectiveness and, parallelly, deprived the beneficiaries of swift disbursement of scholarships and, hence, support from the schemes.

Intervention:

The Ministry, through the DBT portal, decided to formulate a comprehensive umbrella digital platform to bring in much greater transparency, accountability and ease of operation for all the stakeholders involved. The platform utilizes the prevailing best e-governance practices viz. Digi-Locker, Aadhaar, PFMS to bring all the stakeholders together for better information flow and radically improves the citizen service delivery while reducing delays, and redundancies in a sustainable manner.

Through process re-engineering, the Ministry opted for a module-based approach to bring in transparency and enhanced efficacy in line with the prevailing best practices in the e- government sphere.

Impact:

As the platform embraces digitalization, the service delivery in terms of both processing and delivery has seen remarkable improvements as well as mitigation of risk and fraud. Timeline reduction has taken place as submission of Utilization Certificate (UC) and Statements of Accounts Expenses (SOE) are now online. Through Digi-Locker and PFMS respectively, the documentation is easily verified, and funds disbursed in an efficient and transparent manner. Finally, as the stakeholders are connected to each other, grievances can be swiftly addressed. With Key Performance Indicators (KPIs) easily monitorable, a focused execution of scheme objectives can take place. Planning and monitoring of funds can now be done based on beneficiary data. Additionally, the performance of states and UTs can be easily tracked for better implementation and synergy. The enhancement of service delivery has led to a general improvement in the livelihood of the underprivileged groups, leading to upliftment of the tribal population and improved confidence.

Data Analytics and MIS Report Generation:

The onboarding of Centre of Excellence of Data Analytics (CEDA) and National Informatics Centre Services Incorporated (NICSI) for data analytics has led to a detailed data bank in two

years. The data of 44 lakh student beneficiaries of CS and CSS is now readily available. The database additionally allows various kinds of MIS report generation such as district-wise, state-wise, institute-wise, stream-wise, gender-wise disaggregated data for monitoring and evaluation with different stakeholders.

Communication and Grievance Redressal:

The centralized grievance module has been designed and implemented to handle the grievances of all the participating stakeholders – candidates, universities, state nodal officers, UT nodal officers and so on. Alerts and notifications are sent through SMS and e-mail to all concerned stakeholders. All states have been registered on the portal and the principal secretaries of the state, nodal officer for scholarships and nodal officer (technical) have been issued login details to administrative state activities.

The DBT Portal now facilitates two-way communication through its dedicated module:

Ministry with the States: All important letters, announcements and notifications are uploaded on the portal for the consumption of the stakeholders. Provisions have also been made for state-specific correspondences.

States with the Ministry: States now have the ability to raise technical queries and upload proposal documentation relating to SOE/ UC and others. A dedicated team of experts has been deployed to timely address and resolve these queries. This module has facilitated the reduction of time taken for correspondence as physical correspondence has been minimized. Additionally, owing to the increased process efficiency, the state departments utilized the entire budget and cleared pending arrears up to 2018-19, while 25-50 per cent advance for 2019-20 was disbursed by September 2019.

States with States: As the states can now effortlessly communicate with each other, exchanging inputs, best practices and insights are now easily facilitated.

FINANCE AS AN ENABLER

On perusal of the scheme-wise budget and performance in the use of IT and technology on schemes (See Figure 32), it was found that performance of schemes under Rural Development and Urban Transformation sectors are satisfactory irrespective of the budget of the scheme. The Women and Child Development sector has satisfactory performance in its high budget schemes while the performance is in the average-needs improvement range in low budget schemes. The schemes under Health and Jobs and Skills sectors have been performing in the average-needs improvement range in all its schemes irrespective of the budget.

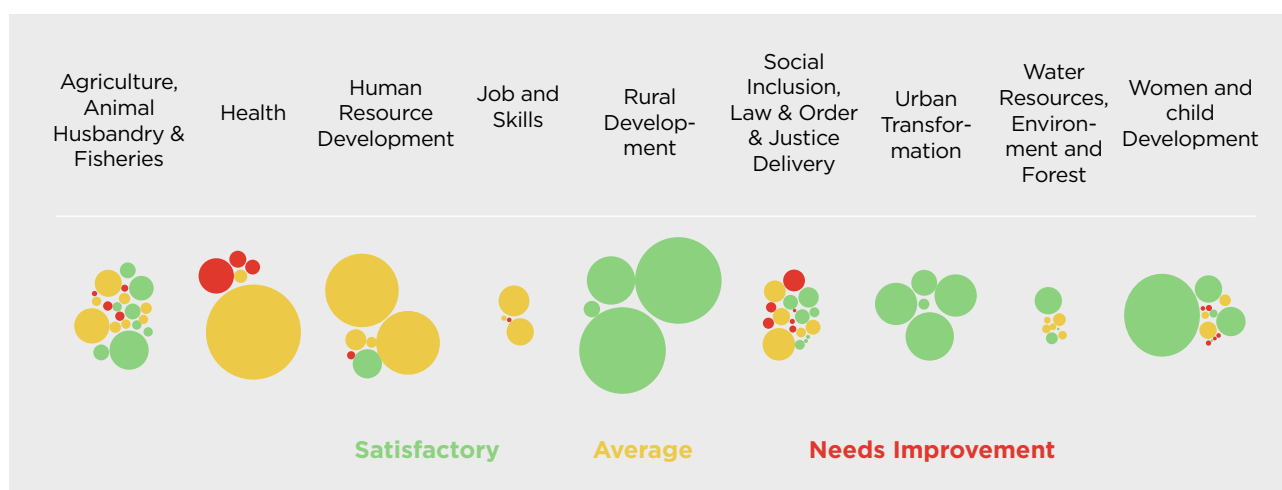


Figure 32: Sector wise performance of schemes in use of IT/Technology³

SUMMARY FINDINGS

Based on analysis of the CSS Evaluation reports, under scheme wise findings, it was found that 33.6% of the schemes performed satisfactorily in IT and technology, 42.7% had average performance and 23.6% had poor performance (See Figure 33).

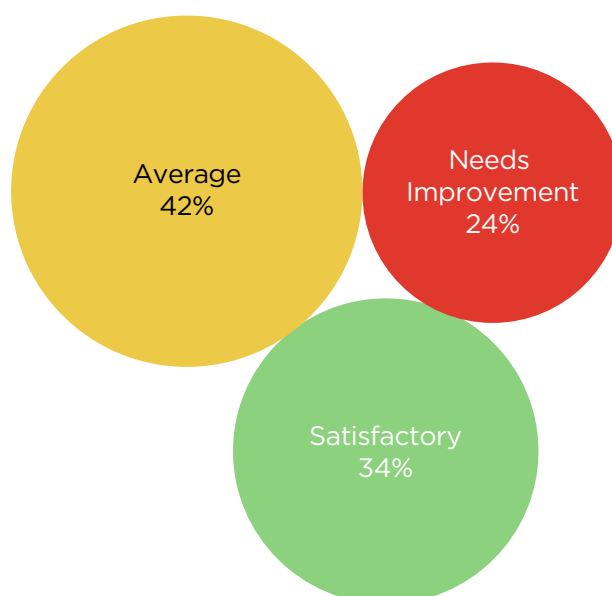


Figure 33: Volume of schemes under each performance category in usage of IT/Technology⁴

³ Each bubble represents a scheme; Size of the bubbles represent the budget - higher the budget, larger the bubble size

⁴ The size of the bubble is proportional to the number of schemes under the performance category

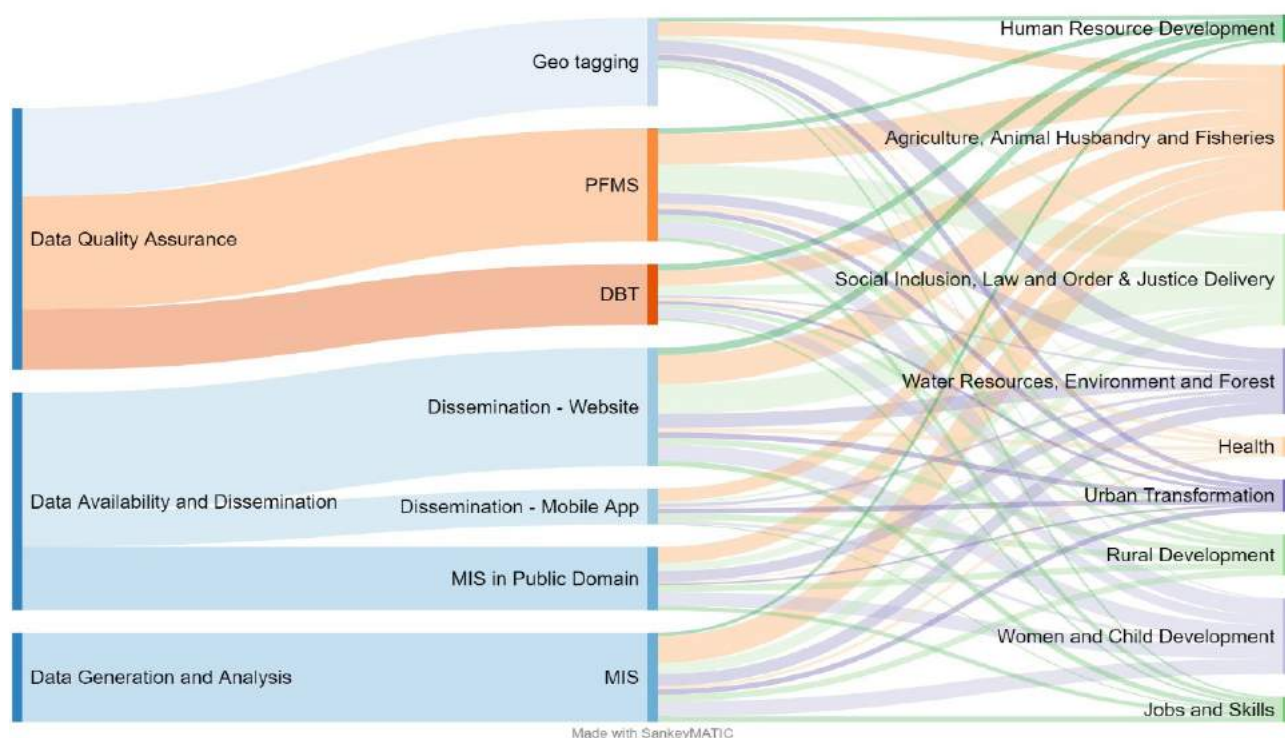


Figure 34: Summary view of sector wise adoption of technology⁵

It was also found that (See Figure 34) maximum adoption is for dissemination using Websites, PFMS, Geo-tagging and MIS. While availability of MIS is there in most schemes, it is available in public domain for a smaller subset.

Further, the performance of the Ministry/Departments that fall under the scope of this study was evaluated based on the performance of the schemes in use of IT/Technology under the respective Ministry/Department (See Table 6).

Table 6: Ministry/Department wise performance in use of IT/Technology

Ministry/Department	Performance of schemes in use of IT/Technology (in %)		
	Average	Needs improvement	Satisfactory
Department of Land Resources	0	0	100
Ministry of Housing and Urban Affairs	0	0	100
Department of Rural Development	17	0	83
Ministry of Tribal Affairs	0	43	57
Department of Justice	0	50	50
Department of Agriculture Cooperation and Farmer's Welfare	40	13	47
Ministry of Home Affairs	67	0	33
Department of Animal Husbandry & Dairying	33	33	33

⁵ Each strand represents a scheme. The higher the thickness of the strand, more the number of schemes.

Ministry/Department	Performance of schemes in use of IT/Technology (in %)		
	Average	Needs improvement	Satisfactory
Ministry of Woman and Child Development	20	47	33
Department of Water Resources, River Development and Ganga Rejuvenation	75	0	25
Department of School Education and Literacy	50	33	17
Department of Social Justice & Empowerment	69	23	8
Department of Fisheries	100	0	0
Department of Higher Education	100	0	0
Ministry of AYUSH	100	0	0
Ministry of Environment, Forests and Climate Change	100	0	0
Ministry of Minority Affairs	100	0	0
Ministry of Skill Development and Entrepreneurship	100	0	0
Ministry of Labour and Employment	50	50	0
Department of Health and Family Welfare	25	75	0

It was found that the schemes under Department of Land Resources, Ministry of Housing and Urban Affairs, and Department of Rural Development was found to have highest adoption of technology, while the scheme under Ministry of Labour and Employment and Department of Health and Family Welfare had the lowest technology adoption.

RECOMMENDATIONS

While around 71.3% of scheme have online MIS, beneficiary and project level data has been collected only for 21% and 30% schemes respectively, where applicable. Majority of scheme MIS had state or district level (~43%) data granularity. Further, 70.7% of the schemes have MIS available in public domain. There is a need for all Ministries/Departments to make all schemes available via public, unrestricted MIS at the lowest granularity possible. Making available high-frequency low-granularity scheme-level data open is imperative to enhance accountability and transparency and to develop a healthy public data ecosystem. It is also important to shift from using data and dashboards as a mere reporting tool to performing analytics.

While making data public, it is also important to ensure that the data is standardised across schemes. Standardisation of data will help in ensuring that the different scheme datasets are comparable with each other. Further, standardisation will also enable scheme divisions to utilise the metadata, project or beneficiary details being collected in any other scheme as a baseline and augment further details to existing datasets. This would not only help in reducing duplication of efforts in data collection and remove data inconsistencies, but will also help in linking databases of different schemes to provide a 360° view of the various schemes/programmes being run by the government.

The scheme-level MIS data must also be made available through Application Programming Interface (API). APIs enables different applications to automate exchange of data securely with ease (IBM Cloud Education, 2022). The API functionality will help in easing the process of bulk data transfers on a regular basis. Absence of a programmatic interface makes usability of data at scale an issue, leading to major loss of value to the public and to future opportunities for research. Making data available via well-structured, well-documented, easy-to-access APIs as the fundamental first step in making public data accessible and usable.

The report reveals that while use of direct benefit transfer (DBT) and geo-tagging have picked pace, there is still a gap in its adoption in all schemes. Universalization of the adoption of DBT in subsidy schemes, and geo-tagging in infrastructure schemes is important to ensure quality in service delivery to beneficiaries.

In order to ensure use of technology become an integral part of the scheme life cycle, it is important to explicitly state its use at scheme design stage itself. This may be done by adding a separate section for IT/Technology to the Expenditure Finance Committee (EFC)/ Standing Finance Committee (SFC) documents.

A dedicated budget for use of IT/Technology may be earmarked to Ministries/Departments at different administrative levels to execute technology related implementation for schemes. A Technology Cell or a Data Strategy Unit (DSU) with subject matter experts may be formed to spearhead this execution. One such model for the DSU is prepared as part of the Data Governance Quality Index (DGQI) initiative, the detailed Terms of Reference (ToR) for which could be referenced (Overview: Data Governance Quality Index, 2022). During scheme design stage, scheme divisions

may hold discussions with DSUs/Technology Cell to understand the latest technologies that can be incorporated in the scheme life cycle.

Along with setting up dedicated units for technology use and creating interoperable high quality data sets, it is equally important to impart training to policy makers with the skills to enable data and technology driven governance.

Last but not the least, in order to accelerate the pace of technology adoption in the government programmes, it is important to capitalize on the knowledge and expertise that sits outside the government through partnerships. Partnerships with domain leaders can be leveraged for drafting sustainable data architecture, implementation support for schemes/programmes and capacity development for government staff.

CONCLUSION

Drawing findings from the third-party evaluation studies of 126 Centrally Sponsored Schemes (CSS) across different sectors conducted by DMEQ, NITI Aayog, this report aims to assess the performance of schemes, sectors and M/Ds against the use of IT and technology. The assessment was conducted for three broad dimensions, i.e., data generation & analysis, data availability & dissemination, and data quality assurance.

It was found that most schemes have an online MIS available. The granularity of data collected on these MISs is majorly at state level and the frequency at which data is reported on the dashboard was majorly taking place either monthly or in real-time. In addition to scheme level online MIS, all sectors can have a comprehensive centralised MIS system for smooth monitoring of various interventions being undertaken by the Government. This MIS/Dashboard system could be updated on a real-time basis to the extent possible, capturing beneficiary/project level data and could be further collated at a national and state level. This will enable better analysis of information to monitor the performance of sectors. MIS (online and/or offline) are either not present or there are no interlinkages and as such function in isolation. There is a need to develop databases on various sub-sector and components/activities therein and develop a mechanism to link these databases for analysis and mid-course corrections to be undertaken, if any, at all levels - national, state and local level.

Further, it is found that only less than half of the total number of schemes had scheme MIS available in the public domain. In order to enhance accountability and transparency, MIS data must be made available in the public domain for all schemes. While making data public, it is also important to ensure that the data is standardised across schemes to ensuring that the different scheme datasets are comparable with each other. The scheme-level MIS data must also be made available through API to help in easing the process of bulk data transfers on a regular basis.

It can also be seen that while PFMS adoption is high in schemes, while DBT and geo-tagging have picked pace, there is still a gap in its adoption by all schemes. Universalization of the adoption of DBT in subsidy schemes, and geo-tagging in infrastructure schemes is important to ensure quality in service delivery to beneficiaries. To aid in the wider adoption of the technology by the users, focus must be given to make MIS dashboards and other IT-tools used in scheme implementation user friendly.

Looking at the Ministry/Department performance, Department of Land Resources, Ministry of Housing and Urban Affairs, and Department of Rural Development are found to have highest adoption of technology, while the Ministry of Labour and Employment and Department of Health and Family Welfare are found to have the lowest technology adoption at the scheme implementation.

Overall, it was found that 33.6% of the schemes performed satisfactorily in the use of IT and technology, while 42.7% had average performance and 23.6% had poor performance.

In order to ensure use of technology becomes an integral part of the scheme life cycle, it is important to explicitly state its use at scheme design stage, set-up a dedicated budget for use of IT/Technology and set-up a dedicated team with subject matter expertise to drive adoption of technology. Further, it is also important to impart training to policy makers with the skills to enable data and technology driven governance. Capitalizing on the knowledge and expertise that sits outside the government through partnerships would be key to accelerate the pace of technology adoption in the government programmes.

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