CASE STUDY 17 GOVTECH

Digital Transformation in Andhra Pradesh, India

Overview

In 2010, municipalities across the Indian state of Andhra Pradesh were unable to collect adequate revenue or deliver the public services that citizens demanded. Through the Andhra Pradesh Municipal Development project, the state progressively leveraged digital government platforms and emerging technologies to improve public services. The government used drones to collect geospatial data and update maps, replaced paper-based systems with digital ones, and trained both staff and citizens on how to use the new platforms. Citizens could access services or lodge grievances through multiple channels: online, by telephone or through a mobile phone application. The reforms significantly reduced opportunities for fraud and corruption in key areas, such as taxation and construction permitting, and improved revenue for local governments.

Introduction

In 2010, Andhra Pradesh (AP), a state located on India's southeastern coast, was struggling to deliver high-quality public services to its 50 million citizens. As urban and economic growth accelerated and cities expanded, provision of urban services, such as roads, water and sanitation fell short of growing demand. For instance, the piped water coverage ratio had declined by over 10 percent in the cities of AP between 1991 and 2001, and municipal sewerage systems served fewer than 20 percent of residents. These service deficiencies were largely a consequence of the inadequate local financial and managerial capacity of urban local bodies.[54] Updating maps was a particularly pressing issue, as towns across the state had rapidly urbanized and grown in population. Without accurate maps, municipal governments could not properly assess property taxes or identify community needs regarding water, sewage, waste disposal, or street lighting. Improving building permits was another major concern. The paper-based submission of construction permits was subject to a high degree of discretion, causing delays and creating opportunities for fraud and corruption.

AP's leaders recognized that digital technologies could help the state increase revenue and improve delivery of government services. In 2010, the government and its development partners launched the Andhra Pradesh Municipal Development Project, which aimed to leverage digital government reforms to address the state's governance challenges. The USD300 million eight-year project planned to use drones, artificial intelligence, and other technologies to collect and integrate geospatial data. Such data was critical for tax and land management purposes. Along with improving data collection, the state wanted to make public services more easily accessible for citizens, and to introduce a citizen feedback system to improve monitoring of public service delivery.

The implementation process

Using new technologies to improve data collection and integration

With the project's support, AP used cutting edge

disruptive technologies—such as drones—to map properties and collect information. Under the project over 1,000 municipal government staff were trained in the use of drones to capture geospatial data. Several rounds of training and capacity building workshops were held to train government staff in all the new systems introduced.

Drones turned out to be cheaper than satellite imagery, the other main option to collect property data, and drone images were also of higher quality. The collected data was analyzed using machine learning and artificial intelligence techniques. For example, the drone images were projected over base maps and connected to other data across multiple applications, providing a complete geospatial view of municipalities. The government linked the newly collected information with existing records across various government departments to enable data exchange and cross-verification. After the information was updated, the government found it easier to match demand and supply for urban services.

The state also introduced an online building permission platform and trained government staff how to use it. The digital submission of construction permit applications with automated artificial intelligence approvals reduced the discretion officials had in the permit approval process.

The AP experience highlighted that no single technology could serve to improve service delivery while also reducing fraud and corruption incidence and risks. Rather, supporting combinations of emerging technologies served to address this goal. Table 7.4 summarizes the technologies that were used to support the AP program. Some technologies used, such as Geographic Information System (GIS) platforms, had been around for many years. However, while installing software manually had not been practical, cloud-based technologies made it easier to deploy GIS platforms across a significant number of municipalities. Both drones and AI in the form applied were indeed a new technology for the decade, at least for this type of application. The reduced cost and complexity of these technologies allowed for their application, while their increased capability met the objectives of the reform.

Increasing access to public services

The government made more than 350 services available online through a website called MeeSeva and provided time-bound service level agreements for those services. The government also made some services available through PuraSeva, a mobile phone application it developed. Several government departments underwent business process re-engineering to encourage availability of online services.

AP created a Citizens Charter that included details of services to be provided along with stipulated timelines and fee structure. This information was available on the MeeSeva website and was also displayed in Citizen Service Centers. The government provided

TABLE 7.4 AP's Transformational Technologies

Technology	Functions	Comments
GIS Platforms	Integration and application of different spatial data layers	Ability to intersect and cross- validate different data
Drones for spatial mapping with AI	Use of drones with AI supported image processing	Rapid mapping and validation of geospatial cadaster information
Enterprise Resource Planning (ERP)	Municipal e-governance system connected to geoportal	Cloud-based integration and software services for wide array of service and management functions
Online Building Permission System (Cloud-AI Supported)	Digital submission of construction permit applications with automated AI approvals	Discretion reduced for officials
Smartphone application for feedback	PuraSeva provides for different channels of citizen feedback	Continuous feedback enabled

legal backing to service level agreements and digital documents. The legal changes ensured that new digital documents were legally valid.

Incorporating citizen feedback

The state launched a citizen feedback mechanism to ensure service standards were maintained and reduce petty corruption. Citizens could leave feedback by telephone, at citizen service centers, or through a new mobile phone application called PuraSeva. Using the application, citizens could geo-tag pictures of service delivery problems, such as water leakages. The application assigned accountability to a municipal engineer to fix the problem, and a dashboard allowed elected officials to view the information in real time.

The government made information on the response taken publicly available. For instance, citizens were provided with access to information regarding the status of their complaints; municipal employees were given toolkits, training, and a way to track their work; city managers were entrusted with data-driven decisions that were real-time and easy to analyze; at the state level, data-driven planning was undertaken based on key performance indicators. If the grievance is actionable, and action taken is made public, more citizens get encouraged to use the platform. Clear accountability and transparency on the response taken encourages more people to use the digital platform, ensuring its success.

In the 2019 fiscal year, more than 125,000 complaints were received. Just 367 went unresolved. The complaints spanned a wide range of service delivery issues, including non-functioning streetlights, water pipe leaks, and absenteeism of street sweepers. Almost half of these complaints were resolved within stipulated timelines. The citizen feedback system was simple, transparent, and increased accountability of civil servants and municipal officials.

Lessons learned

What was achieved?

The project leveraged technology to boost transparency and strengthen accountability. It also increased citizen engagement by making real-time information on citizen grievances available, along with information on the government's response. The initiative increased responsiveness and efficiency as services had to be delivered within fixed timelines or else the cause of the delay had to be reported.

Integrated service delivery platforms supported the entire lifecycle of city governance. The platforms were used for planning, implementation, results monitoring, and feedback for corrective action. Multiple technologies were connected, departments were able to exchange information, and data was no longer in silos.

The new systems enabled municipal governments to collect accurate information, which in turn provided two key benefits:

- ***It helped curtail tax evasion.*** Revenue from property taxes and water charges more than doubled from 2015 to 2019.

- ***It improved the monitoring and delivery of public services.*** For example, piped water was provided to over 200,000 households, and processing times for citizens to apply for public services reduced significantly.

Citizens benefited from digital technology as it enabled them not only to take advantage of better service delivery, but to do so at a lower cost and with less human interaction. Citizens could access services or lodge grievances through multiple channels, including the PuraSeva mobile phone application, Mee-Seva citizen service centers, websites, or through phone calls.

What led to these achievements?

1. ***Strong political will*** to improve governance and make AP more attractive for investors was an essential driver of the reform. There was considerable push from AP's top leaders to introduce technology-based reforms to combat inefficiency and corruption prevalent in municipal systems. Despite a change in political leadership in 2014, the new government continued to support technology driven reforms and sustained the momentum. The new government that came to power in 2019 also continued to use and enhance the platform to improve service delivery.

2. ***'Analog complements'*** such as business process re-engineering and complementary reforms supported the technology driven governance reforms. The state government drew up time-bound service level agreements (SLAs), with legal backing, for almost 385 services, which even today are being delivered through the integrated online portal 'Mee-Seva,' while some services are available through the app 'PuraSeva.' Putting the 'Citizens Charter' on the 'Mee-Seva' website as well as in the Citizen Service Centers enhanced transparency and raised awareness. In addition, several government departments underwent business process re-engineering to deliver online services more efficiently.

3. ***Real-time data*** enabled stakeholders across sectors to develop innovative solutions. Getting real time data—whether on working streetlights, garbage collection, or unauthorized constructions—had to be available, up to date, and easy to use and analyze for the process to be successful. Citizens had access to information regarding the status of their complaints; municipal employees could track their work; and city managers could make data-driven decisions. At the state level, data-driven planning was undertaken based on key performance indicators. Actions taken on grievances were made public to enhance trust and encourage greater use of the platform.

4. ***Training and capacity building programs*** helped reduce resistance from government staff and encouraged the uptake of new technology by citizens. Government staff across all 110 urban local bodies (ULBs) in AP received training on using the building permission platform; over 1,000 ULB staff were trained in the use of drones to capture GIS data; and other staff were trained in using the new systems.

Combining all these elements was the key to success. Thus, integrated digital technology, including the use of drones, GIS mapping, processing with artificial intelligence, E-governance (ERP) dashboard, geo-portal, Pura Seva app and Mee-Seva platforms, automated building permission approval systems, and the seamless linkage with various other government applications had to go hand in hand with extensive training of government staff on the use of the ICT applications. This combination, all together, helped improve both municipal service delivery and the tax revenues of the ULBs, while making the system responsive, inclusive, and participatory.

Final reflections

The recent developments in digital technologies have continued to catalyze public service delivery improvements, while potentially circumscribing fraud and corruption. Drones continue to rapidly increase the availability of increased resolution spatial and temporal data. Similarly, specialized sensors (IoTs) have significantly reduced the cost of data collection from the field. Significant advances in data processing and artificial intelligence coupled with cloud (and potentially quantum) computing can enable a vast amount of data from varied sources to be analyzed and used for evidence-based informed decision-making.

Major advances in encryption and data protection technologies, together with robust interoperability and data-sharing strategies, have opened up an entirely new ecosystem of public and private sector players in developing new and innovative services, while preserving data confidentiality where necessary. These developments (collectively called Industry Revolution 4.0) provide unprecedented opportunities to formulate new policies that help overcome information gaps/asymmetries, enabling a common platform for multiple agencies to work together and deliver services in ways that were not possible earlier.

AP did not have advanced technology initially, but was able to "leapfrog" to the adoption of a set of emerging technologies. The past decade of success in AP suggests that national, and particularly sub-national governments, need to foster digital strategies that are broader than the current ICT strategies. They should foster a policy and institutional environment that promotes transparency and accountability, encourages uptake of new technology, invests in digital literacy and ensures broad-based digital strategies that improve participation by all, while keeping cyber-security concerns and data protection in mind.

The experience of AP shows that technology can be a great enabler of better service delivery and good governance, provided there is strong participation by citizens and government in the uptake of this technology and if the political leadership is strongly supportive.

Notes

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18. See U4, 2016.
19. Cf. Hashim, Ali; Piattifuenfkirchen, Moritz Otto Maria Alfons; Cole, Winston Percy Onipede; Naqvi, Ammar; Minallah, Akmal; Prathna, Maun; So, Sokbunthoeun. 2019. The Use of Data Analytics Techniques to Assess the Functioning of a Government's Financial Management Information System : An Application to Pakistan and Cambodia (English). Policy Research working paper; no. WPS 8689. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/226121546531748578/The-Use-of-Data-Analytics-Techniques-to-Assess-the-Functioning- of-a-Governments-Financial-Management-Information-System-An-Application-to-Pakistan-and-Cambodia.
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41. Cf Russian Hackers May Have Carried Out Largest Ever Crypto Exchange Theft
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