K4D | Knowledge, evidence and learning for development

E-governance innovations in India

Laura Bolton
Institute of Development Studies
29 January 2019

Question

What are the large-scale e-governance innovations in India in the following sectors: Healthcare Services, Agricultural Productivity, Clean Water, Sanitation & Hygiene, Clean Energy, FinTech and Waste Management?

Contents

1. Summary

E-governance innovations for the purposes of this report were defined as: any innovations which have used technology to reach scale, increase impact and improve monitoring and evaluation.

This review looked for examples of e-governance innovations in India in the following sectors: healthcare services, agricultural productivity, clean water, sanitation & hygiene, clean energy, FinTech and waste management. Many of the examples were found on the Digital India website. Digital India is a government programme aiming to "transform India into a digitally empowered society and knowledge economy". Other examples were found highlighted in news items and a smaller number were discussed in academic literature.

Many examples were identified in the health and agriculture sectors, while fewer examples were found for the other sectors and none for the clean energy sector. Searching identified Information Communication Technology (ICT) activity in these sectors which were not classed as e-governance (ie. did not have government involvement) and therefore not included. The review also found many e-governance examples not related to the sectors requested and therefore were also not included.

Within the research time is was not possible to explore for each of the examples how active the initiative was. Some seemed to be well-used whereas some had broken web links or did not show signs of recent activity.

Key findings:

- A vast array of ICT-based initiatives are being explored in the government health sector in India. Information management systems facilitate digitalisation of health records, human resource management, and stock tracking to improve supply chains. Websites and mobile applications are being used to provide health information and reminders to patients. There are also applications to support staff training and diagnostic services.
- The main initiative linking government to people in the agriculture sector is the agriculture section of the National Portal of India. Here farmers can access documents, forms and policy information. It can also be used to apply for subsidies and renew licenses.
- A number of ICT portals were identified which functioned to provide farmers with market and weather information. Other useful services include initiatives to manage soil quality and systems for pest and disease surveillance.
- The Central Pollution Control Board e-governance website provides information on water suitability and a system for reporting air and water quality data. It also provides forms for inspections and for opening legal cases.
- In the sanitation and hygiene sector there is a government website supporting and reporting on the 'open defecation free' campaign. There is also an app which helps citizens to highlight their contributions to the initiative to clean up India.
- In the FinTech sector the government are creating technology to improve financial service access to enable all citizens to have a bank account.
- There is also technology being used within the government to streamline financial systems such as assessing and distributing benefits. And for improving networks between central and state departments.

- Examples in the waste management and clean energy sectors were not found within the scope of this report.

2. Healthcare services

Innovations include services providing information on different health areas; online registration for patients and clinics; organisation licensing; recording donor availability; drug stock management; patient tracking and monitoring; disease surveillance; patient messaging; patient records; and disability certification.

One piece of research was identified on health e-governance. It describes the health management information system (HMIS) in Tamil Nadu which brings together real-time data at state level and links institutions (Kaushik & Raman, 2015). It tracks individual patient data which can be used for planning healthcare and managing drug stocks. It also functions to review performance of healthcare institutions. The research associated the routine use of health information with better outcomes.

Examples found through search

National Health Portal. Health information for citizens. https://www.nhp.gov.in/

Online registration system. Services include fee payment, online diagnostic reports, and enquiring availability of blood. https://www.ors.gov.in/

Online Registry of Clinical Establishments.
http://clinicalestablishments.gov.in/cms/Home.aspx

Food Safety and Standard Authority of India (FSSAI) page on the National Portal of India. The site can be used for issuing licenses to food business operators. It also provides information on legislation, food standards and safe food practices. https://fssai.gov.in/home

National Organ & Tissue Transplant Organization (NOTTO). Web portal for donor registration and for retrieval. http://notto.nic.in/

National Identification Number (NIN) to Health Facilities. A web application for registration.
http://nin.nhp.gov.in/login.php

Nikshay. Online tracking of TB patients.
https://nikshay.in/

Integrated Disease Surveillance Programme (IDSP). Online portal for data entry, reports, data analysis, and training modules. http://idsp.nic.in/

Health Management Information System (HMIS). Monitors programmes under National Health Mission. https://nrhm-mis.nic.in/SitePages/Home.aspx

The Government of India have introduced the **M-Cessation** mobile app nationwide to help people stop smoking https://www.nhp.gov.in/quit-tobacco.

M-diabetes. Application for diabetes messaging. http://mdiabetes.nhp.gov.in/

Swasth Bharat (Disease, Lifestyle, First Aid). Online information aims to empower citizens to find reliable health information. https://www.nhp.gov.in/nhp-swasth-bharat_pg

Vaccine tracker. Parents can track the immunisations of their children. Part of the national health portal. https://www.nhp.gov.in/nhp-indradhanush_pg

National Health Portal Directory Services. Mobile application holding blood bank information. https://www.nhp.gov.in/nhp-health-directory-services-mobile-application_pg

A blog post on the GSMA (Groupe Speciale Mobile Association) website describes **Kilkari**, a mobile health education service reaching two million subscribers in its first year of launch. Nationwide, it delivers free, time-appropriate audio messages about pregnancy, child birth and child care. https://www.gsma.com/mobilefordevelopment/programme/mhealth/an-overview-of-kilkari-a-maternal-and-child-health-service-in-india/

'**TB missed call initiative**' is reported on news sites[1] and developed by Microsoft. Patients ring a number that is revealed when they have continued to take pills from a blister pack. Missed doses trigger SMS notifications. The system is reported to have enrolled 93,000 patients in 4 years. The government are supporting the initiative.

e-Health India. National health portal of India

https://www.nhp.gov.in/e-health-india_mty

The e-Health India website describes vision and benefits for improving access, quality, affordability, disease burden and monitoring and evaluation. The site but is not clear on how these are to be achieved. It describes the Intention for an Integrated Health Information Programme (IHIP) which aims to create standards compliant Electronic Health Records (EHRs) across India.

State level e-health initiatives are also described:

Gujurat:

- Gujarat Hospital Management Information System (GHMIS) http://www.gujaratinformatics.com/hmis.html
- Ability Gujarat. Assesses Persons with Disabilities and issues "disability certificates". (Web link not working http://www.ability.gujarat.gov.in/portal/index.jsp)
- Drug Logistics Information & Management System: DLIMS. A database of drug stocks and medical equipment. Permission required to access site: http://dlims.guj.nic.in/frmlogin.aspx
- e-Aushadhi, a supply chain management application
- Birth & Death Entry Application System (BADEA). Registration database. E-Olakh is also mentioned as a system for recording births and deaths. Not described how the two systems differ or work together.

[1] Eg. https://health.economictimes.indiatimes.com/news/industry/how-a-missed-call-is-saving-lives-of-tb-patients-in-india-world-tb-day-is-on-march-24/63438182

- Mukhya Mantri Amrutam (MA). Improving access for ‘below poverty line’ families. Manages information on eligibility and records authorisation.
- E-Mamta (MCTS) tracks pregnant women and children for public health initiatives. http://e-mamta.gujarat.gov.in
- School Health Program (SHP) maintains child and adolescent health records.

Rajasthan:

- E-Mitra, implemented in all 33 districts using a public-private partnership model bringing together various government and private services under one roof. The e-platform is accessible from counters known as kiosks. Link not working http://emitra.gov.in/
- Asha Soft, component of a large community healthworker programme. It captures beneficiary details, takes online payments, and generates reports. http://ashasoft.raj.nic.in/Private/login.aspx
- E-Aushadi, as above.
- Rajasthan - Mukhyamantri Nishulk Dava Yojana (MNDY). Diagnostic services for all government institutions.
- Pregnancy, Child Tracking & Health Services Management System. Maintains online data of more than 13000 government health institutions in the state. http://pctsrajmedical.raj.nic.in/private/login.aspx
- IMPACT, Integrated System for Monitoring of PCPNDT (Pre-Conception and Pre-Natal Diagnostic Techniques) Act. , . Website monitors tracking devices fitted in sonography machines to uphold prohibition of sex selection and stop female foeticides. http://pcpndt.raj.nic.in/
- CHRIS – Computerized Human Resource Information System. System to keep employee data. http://www.chrisnrhm.org/
- Health Information system for Government (HEALING). Management information system for Medical Health & Family Welfare department, Government of Rajasthan. Website unavailable: http://rajmedical.raj.nic.in/

Tamil nadu:

- Award winning Hospital Management System (HMS)
- Cash Assistance to Pregnant and delivered mothers (MRMBS). Part of the welfare scheme delivered through the web. http://mrmbs.tn.nic.in/
- State Health Data Resource Centre (SHDRC). Collecting huge amounts of data from primary, secondary and tertiary facilities for analysis.
- Health Management Information System (HMIS): holds unique identifiers for hospitals, patients and users, has user friendly forms, online health records, provides for patient referral, enables real-time data and has drug inventory functions.
- Pregnancy and Infant Cohort Monitoring and Evaluation (PICME). Mothers receive a unique number and their details are entered into a database. Data produced can be used for high risk referral and monitoring. http://icds.tn.nic.in/Convergence.html

Uttar Pradesh:

- DVDMS (LMIS) Drugs & Vaccine Distribution Management system. Procurement, inventory and supply chain management.
- Uttar Pradesh HMIS.
- Human Resource Management System – HRMS.
- ASHA Mobile Application. Assistance for those counselling pregnant and post-partum women.
- Mobile Kunji – academy. Aims to facilitate communications on health between the government and public using audio visual multi media.
- M-Sehat – delivers counselling and lifestyle advice alerts. It also tracks beneficiary health and nourishment outcomes.

Andrah Pradesh:

- Rashtriya Bal Swasthya Karyakram (RBSK) screens children for defects at birth, diseases, deficiencies and development delays including disabilities. It is a cloud based, Tablet PC system, providing dashboard based reports for various levels of administrators/doctors at all levels.

Chhattisgarh:

- Mitaan – a tablet-based reporting service for reproductive and child health staff including service reminders, job charts, work plans and budget monitoring.
- Jagaar – a tablet-based application delivering training videos for auxiliary nurse midwives.
- Nearest health facility – uses global positioning system to help users locate their nearest available health facility.
- E-drug indenting system – analysing drug demand, drug inventory, birth and death registration, and equipment maintenance.
- Drug Procurement and Distribution Management Information System (DPDMIS) – centralised monitoring and control of procurement & distribution.
- Health Infrastructure Management Information System – streamlines management by capturing work information with budgets and grants.

All e-health initiatives are listed here: https://www.nhp.gov.in/e-health_initiatives_from_states_across_india_mtl

3. Agriculture

A number of the examples of government involvement in ICT for agriculture seem to offer similar services: knowledge dissemination, weather reporting and market information. There is also an initiative monitoring pests and disease. The agriculture section part of the National Portal of India provides access to online services and forms. It provides updates on news and policy information.

E-governance examples in the agriculture sector include:

The agriculture section of the **National Portal of India** provides services, documents and forms as well as news and policy information. Farmers and fishermen are able to renew licenses for crop protection, apply for subsidies, apply for agricultural income certification, and request land. Details of demands for grants are provided through the portal from different related government departments. https://www.india.gov.in/topics/agriculture

e-Panchayat is an e-governance initiative for the rural sector aiming to function as a self-governance system. The platform aims to enable local voices to share practical stories and challenges. http://epanchayat.in/

Farmer Portal aims to provide information and services to improve existing delivery channels by the Department of Agriculture. It aims to bring together market information; details of production, storage, and sales; and a feedback module for responding to queries. https://farmer.gov.in/

The fertiliser monitoring system is funded by the Government of India and captures information for the different stages of the value chain. It links farmers with product information from private companies. http://www.urvarak.co.in/

Kisan Suvidha, a Digital India initiative, is a mobile app providing information to farmers. Farmers can be informed on the weather alerts, market prices, availability of seeds and fertilisers, agro advisories etc. http://www.kisaansuvidha.com/

Pusa Krishi is an app designed for farmers to use in the fields. It provides information on the weather so that farmers can take measures to save crops. It provides information on new crop varieties, resource conserving practices and farm machinery.
http://agricoop.nic.in/recentinitiatives/mobile-apps-kisan-suvidha-and-pusa-krishi-launched

mKISAN is a mobile based advisory service linked to call centres connected to research centres. Knowledge is disseminated to farmers that is timely, specific, holistic and needs based. It provides information in farmers local language. https://mkisan.gov.in/default.aspx

Soil Health Card promotes integrated nutrient management through the use of chemical fertilisers and organic manures. Provides soil test based recommendations and ensures quality control of fertilisers. It is widely used. https://soilhealth.dac.gov.in/

Crop Pest Surveillance and Advisory Project (CROPSAP) in Maharashtra. Real time pest monitoring and use of communication technology to raise awareness and for training (Deshmuk, 2014; Venilla et al., 2016). When pest levels reach a certain point campaigns are organised and pesticides are subsidised. Thus the government was able to contribute to the wellbeing of the agricultural industry through the use of this technology.

National Agriculture Market (eNAM) is a pan-India electronic trading portal creating a national market for agricultural commodities through a government platform. It includes commodity arrivals and prices. It enables some buying and selling offers. https://www.enam.gov.in/enam/

AgMarknet provides agricultural market information and price trends through a government platform. http://agmarknet.gov.in/

Afrimarket APP is a government initiative to keep farmers informed of crop prices so they can maximse profit. It uses GPS to deliver locally relevant information.

https://uidai.gov.in/beta/ There is also a crop insurance mobile app
http://mkisan.gov.in/downloadmobileapps.aspx

4. Water, Sanitation and Hygiene

E-governance portals are listed on the **Central Pollution Control Board** website for pollution monitoring and reporting. Registration is required for access. It also provides information on the suitability of water in certain areas, forms for opening a legal case, inspection reporting forms, system for entering air and water quality data, and a complaints portal.
http://cpcb.nic.in/e-governance-portals/

There are a number of IT based **Innovations in Sustainability of Water Resources** covering pest/disease management; groundwater level improvement; water efficiency; urban flood management; and water quality monitoring with a wireless sensor network system. It is not clear how current these are.
http://meity.gov.in/content/it-based-innovations-sustainability-water-resources

NextDrop enables data gathering for water distribution networks to identify problems in urban areas. https://nextdrop.co/#/

There is communication material on the **Ministry of Drinking Water and Sanitation** website on open defecation. Data on 'open defecation free' villages are shown for different regions. Guidelines, technical notes, studies and surveys can be accessed through the site. For citizens there are FAQs, progress reports, a form for grievance redressal, and guidelines for sanitation.
https://swachhbharatmission.gov.in/SBMCMS/communication-material.htm

The **Water Resources Informatics Division** aim to converge core technologies and e-governance to provide web technology based services. How this will be achieved or what it will look like is not reported. http://waterinfo.gov.in/

SWATCH BHAARAT app is part of an initiative to clean up India where you can post before and after photos of your contributions. https://swachhbharat.mygov.in/

A systematic **review of global examples** published in *Environment Science and Policy* discusses the potential of ICT tools for public participation in **urban water governance** (Mukhatarov et al. 2018). It includes one example from India where GIS is used to get citizen input into planning. The authors find that, globally, ICT does keep citizens better informed and enable some co-production of services. However, they find few for opportunities for citizens to engage in deliberation and authority in decision-making is not affected. They highlight that ICT tools alone cannot enhance inclusive governance without the political will to include for meaningful citizen participation.

5. Clean Energy

No e-governance initiatives were identified on clean energy within the rapid search scope of this report.

6. FinTech

FinTech is defined as: computer programmes and other technology used to support or enable banking and financial services.[2] In the case of e-governance that would include financial transfers made between the government and the population using ICT. The sector in India is said to be emerging and dynamic.[3]

Jan Dhan Yojana is a scheme launched by the government which aims to improve access to financial services for those without a bank account. Account holders have insurance and loan benefits; and mobile banking facility.

A consultancy report looks at FinTech policy in India with a focus on the private sector rather than e-governance (swissnex India, 2016). It notes the regulatory role of the government to incentivise innovation and entrepreneurship, stating that India has the second-largest number of FinTech start-ups in the Asia-Pacific region.

The Government of India launched the Digital India programme with the objective of transforming public services so that India is a digitally empowered society.[4] Digital India initiatives include:

- **Aadhaar**. A policy tool for financial inclusion, managing fiscal budgets, and people-centric governance. It aims to eliminate fake identification for transparent welfare schemes.
- **Direct Benefit Transfer** (DBT) designed to enable information and funds to flow more efficiently. It aims to ensure accurate targeting of beneficiaries, and reduces duplication and fraud. https://dbtbharat.gov.in/
- **eTAAL** organises e-Transactions statistics of National and State level e-Governance Projects. It is used for quick analysis of transactions.
- **Paygov India**. Common e-governance infrastructure offering end-to-end transactional experience for citizens accessing various services through one gateway. http://paygovindia.gov.in/
- **Public Financial Management System (PFMS)**. This has networked across Ministries and Departments in four States of Madhya Pradesh, Bihar, Punjab and Mizoram. It is planned to be rolled out nationally to link financial networks of central government and state agencies. https://cpsms.nic.in/
- **Single Window Interface For Trade (SWIFT)**. Part of the "Ease of Doing Business"[5] initiatives. This project facilitates trading across borders in India. It enables customs services for importers and exporters to lodge clearance documents and request permissions from other regulatory agencies. Reducing interface with government agencies makes efficiency gains. https://www.icegate.gov.in/SWIFT/about-us.html

[2] https://www.google.com/search?rlz=1C1CHBF_en-GBGB768GB768&q=Dictionary#dobs=fintech

[3] https://www.india-briefing.com/news/future-fintech-india-opportunities-challenges-12477.html/

[4] https://digitalindia.gov.in/content/about-programme

[5] http://www.doingbusiness.org/en/rankings

7. Waste Management

One journal article on e-governance in the waste management sector was found which suggests a proposal for an innovation (Ilangovan & Meena, 2016). Authors suggest linking hygienic solid waste management with ICT to assist and monitor the dump bins using geographic information systems (GIS). They also suggest using GPS to monitor waste collection vehicles.

8. References

Datt, R., & Tripathi, P. (2012). Healthcare web services by e-governance. *International Journal of Computer Applications Technology and Research*, *1*(3), 64-69. https://ijcat.com/archives/volume1/issue3/ijcatr01031001.pdf

Deshmuk, P. (2014) Crop Pest Surveillance and Advisory Project, Maharashtra. In: Kaushik, A. (ed.) (2014) Driving Process Change: Innovative e-Government Practices from India. Macmillan.

Ilangovan, P. & Meena, K. (2016) **APPs on e-Governance for Solid Waste Management.** International Journal of Computer Science Engineering, Volume 5, no. 4. http://www.ijcse.net/docs/IJCSE16-05-04-008.pdf

Kaushik, A., & Raman, A. (2015). The new data-driven enterprise architecture for e-healthcare: Lessons from the Indian public sector. *Government Information Quarterly*, *32*(1), 63-74. https://www.sciencedirect.com/science/article/pii/S0740624X14001579

Mukhtarov, F., Dieperink, C., & Driessen, P. (2018). The influence of information and communication technologies on public participation in urban water governance: A review of place-based research. *Environmental Science & Policy*.

Sharma, P., Shivaram, T. R., & Sharma, A. (2016). A Methodical Review of e-Health Systems Developed for Indian Healthcare Sector. *Indian Journal of Science and Technology*, *9*(44). http://www.indjst.org/index.php/indjst/article/view/105077

Vennila, S., Lokare, R., Singh, N., Ghadge, S. M., & Chattopadhyay, C. (2016). Crop pest surveillance and advisory project of Maharashtra-A role model for an e-pest surveillance and area wide implementation of integrated pest management in India. *ICAR-National Research Centre for Integrated Pest Management, New Delhi*, *110*, 012.

9. Acknowledgements

We thank the following experts who voluntarily provided suggestions for relevant literature or other advice to the author to support the preparation of this report. The content of the report does not necessarily reflect the opinions of any of the experts consulted.

- Anjali Kaushik, Management Development Institute
- Ajay Dutta, Panjab University
- Charru Malhotra, Indian Institute of Public Administration

Suggested citation

Bolton, L. (2019). *E-governance innovations in India.* K4D Helpdesk Report 525. Brighton, UK: Institute of Development Studies.

About this report

This report is based on nine days of desk-based research. The K4D research helpdesk provides rapid syntheses of a selection of recent relevant literature and international expert thinking in response to specific questions relating to international development. For any enquiries, contact helpdesk@k4d.info.

K4D services are provided by a consortium of leading organisations working in international development, led by the Institute of Development Studies (IDS), with Education Development Trust, Italy, University of Leeds Nuffield Centre for International Health and Development, Liverpool School of Tropical Medicine (LSTM), University of Birmingham International Development Department (IDD) and the University of Manchester Humanitarian and Conflict Response Institute (HCRI).