From Digital Projects to Digital Government

Transforming Complex Systems Improving Citizen Experience

Lessons from Keralam and India

'Workshop on accelerating digital transformation projects for sustainable cities and communities'

ITU Geneva

Simplifying Land Administration Enhancing Efficiency

Ente Bhoomi

COVID Jagratha Samithi

Nammude Keralam

e-Health Kerala

PEOPLE

POLICY

PLACES

GOVERNANCE





Seeram Sambasiva Rao, IAS

Government of Kerala

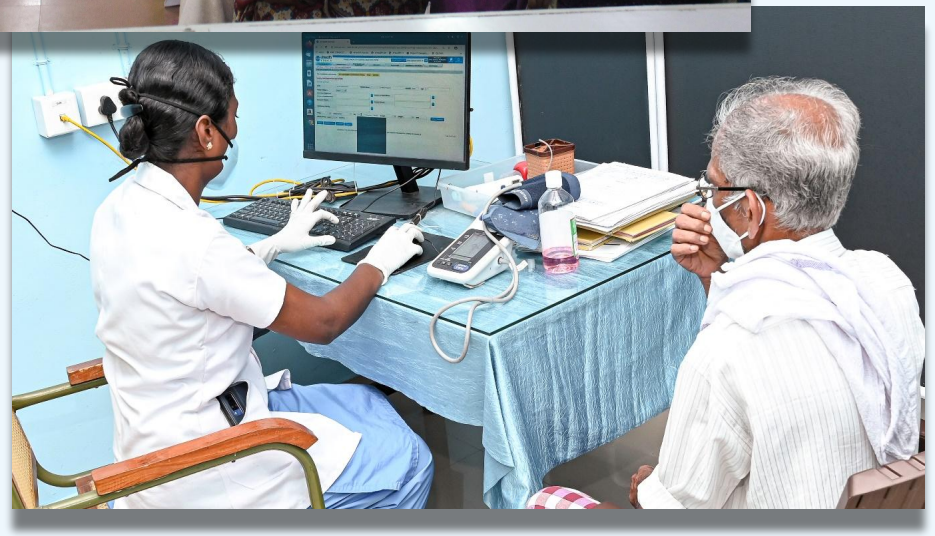
e-Health: from unused computers to redesigned care





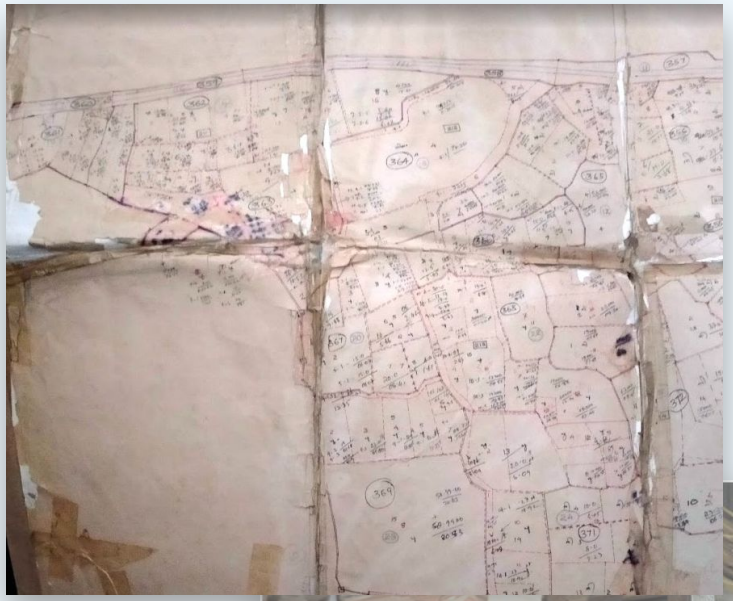
Computers lay covered and unused. A comprehensive healthcare transformation project had stalled.





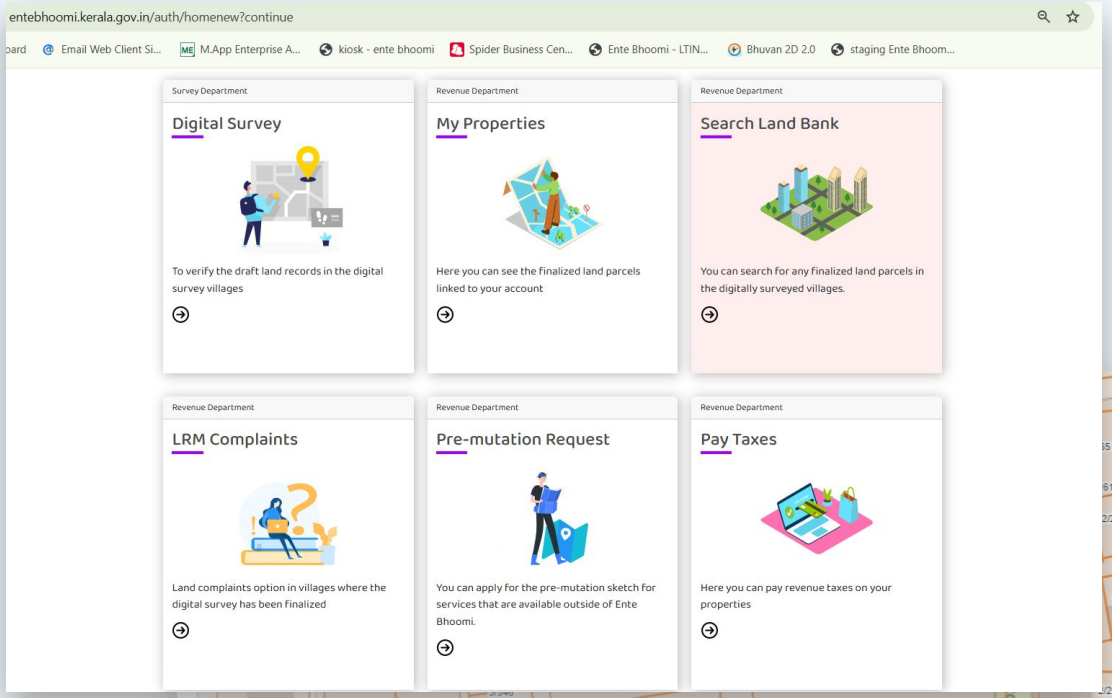
What did it take to turn this around and successfully implement e-Health in crowded public hospitals?

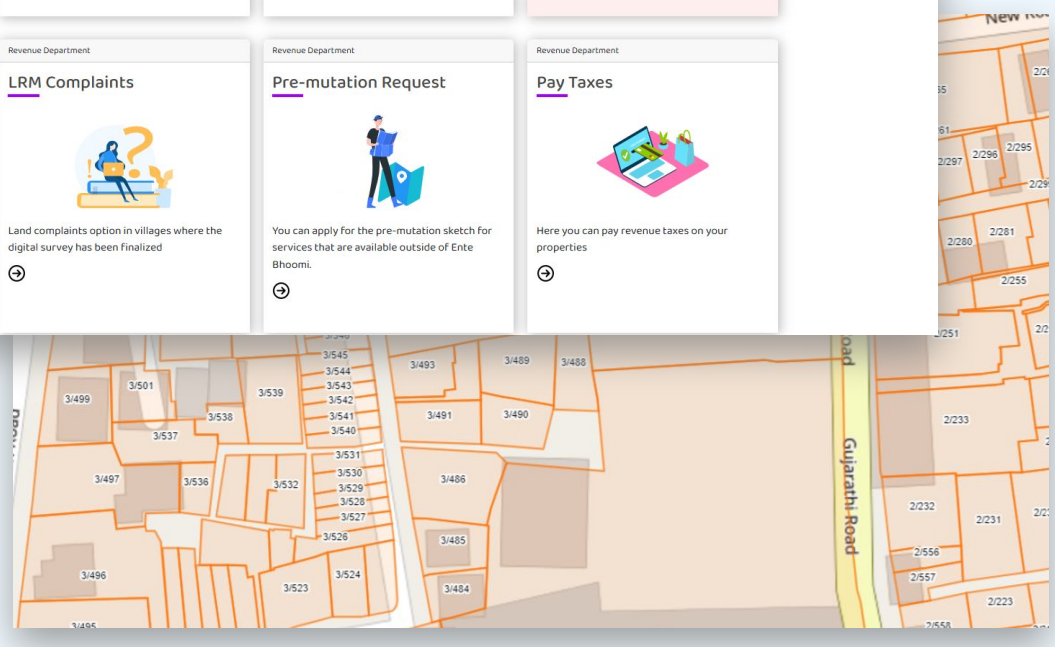
Ente Bhoomi: addressing an old administrative puzzle





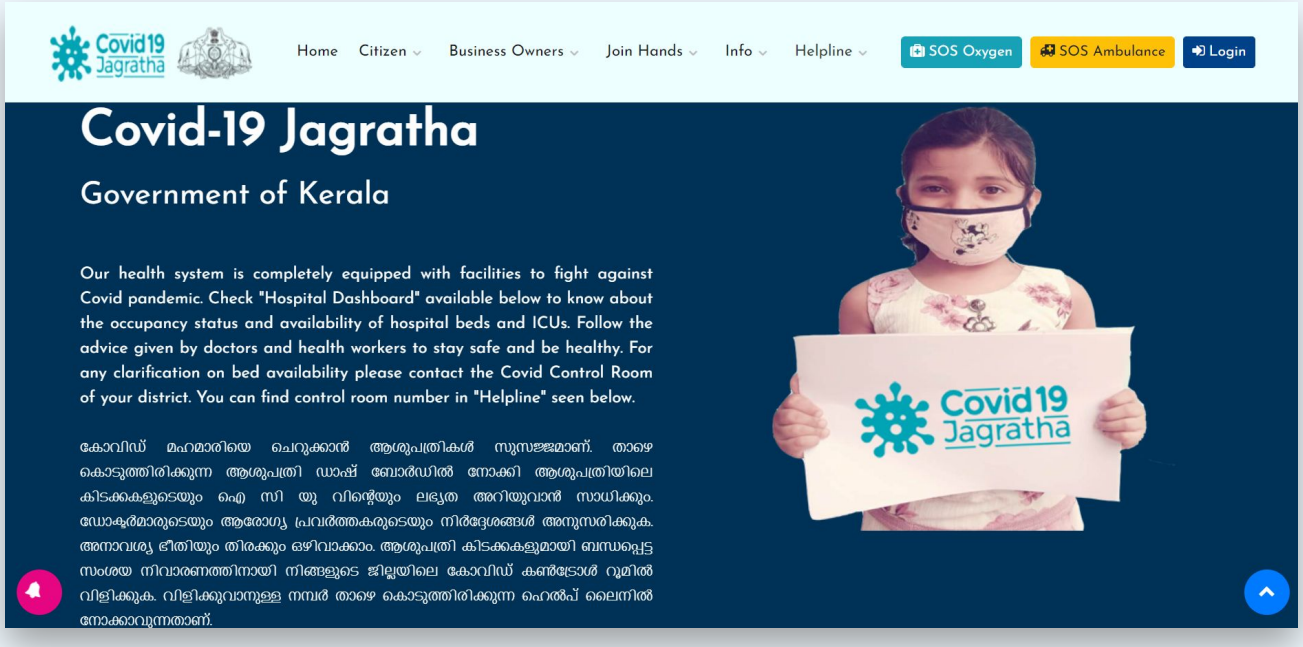
Inaccurate land records, disconnected processes and fragmented institutional responsibilities had made modernization of land administration one of India's long standing administrative puzzles.



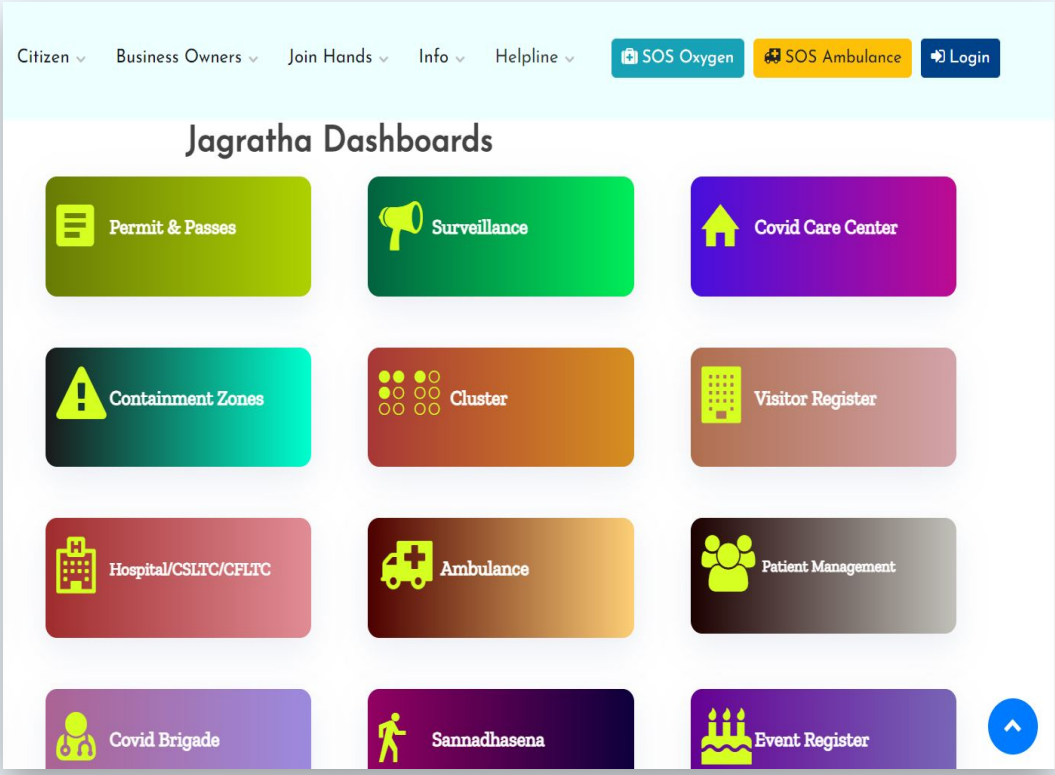


What did it take for Kerala to address this through Ente Bhoomi—and redesign an entire land administration system as a model for the country?

COVID Jagratha: managing a prolonged crisis



COVID surges placed sustained pressure on hospital capacity, public administration and daily life. Kerala's challenge was to coordinate care and resources, protect lives and enable essential activities to continue.



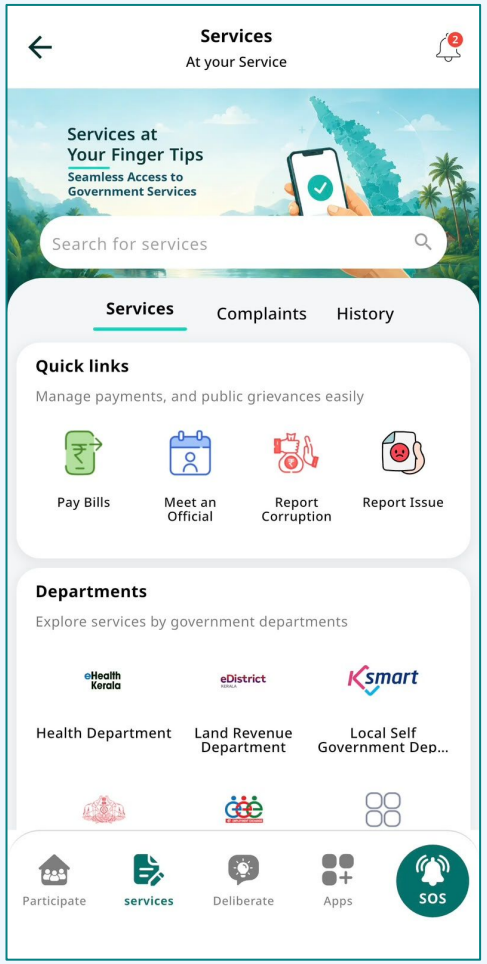
What did it take to manage COVID with minimal fatalities, avoid a scramble for hospital beds, and help society transition to "living with COVID"?

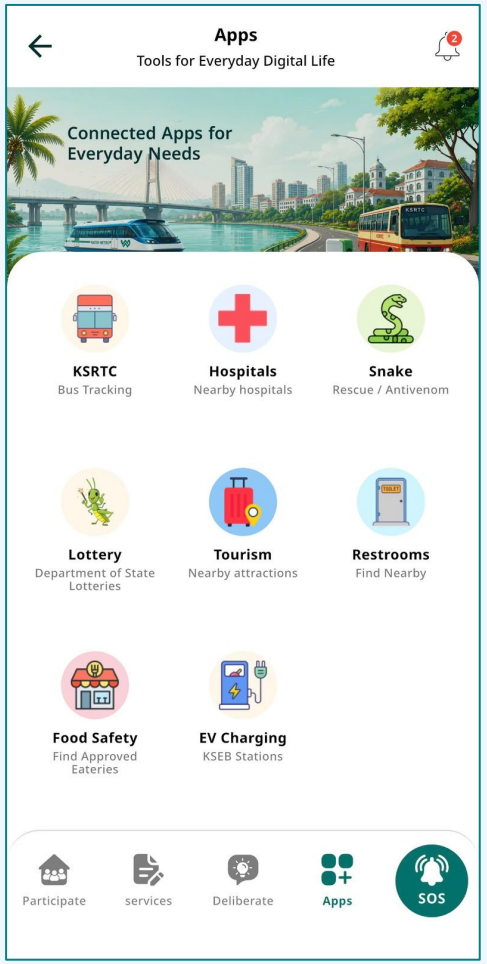
Nammude Keralam: towards one citizen experience

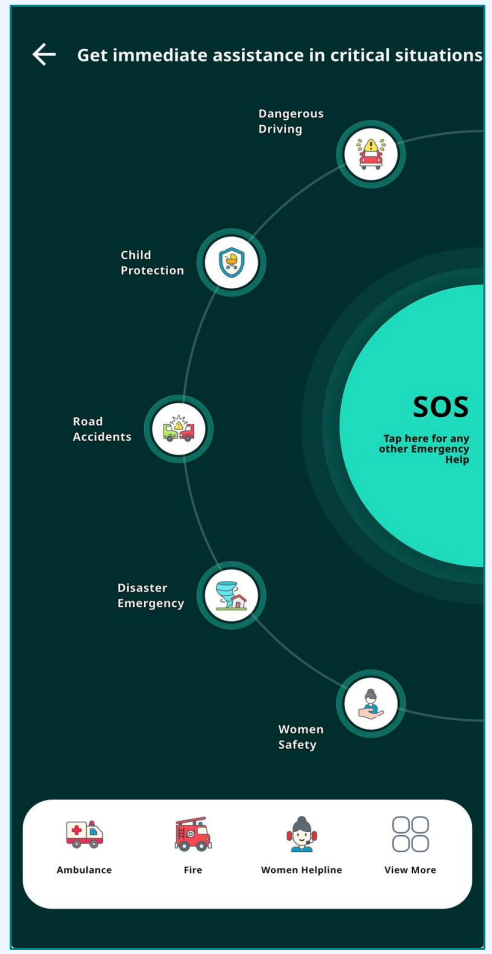


Many departmental applications had evolved with different service standards, disconnected journeys and uneven citizen experience.

How can Nammude Keralam 2.0 and the Digital Kerala Architecture bring one unified citizen experience across this legacy ecosystem—for independent users as well as citizens who need assistance?







What does it take to translate a digital transformation vision into **better citizen experience and effective governance**—even in the most difficult settings?

Kerala's experiences offer a practical framework for aligning people's needs, technology choice, funding and governance —and connecting individual reforms through a shared digital architecture.

The framework can be applied across contexts. Its design must fit local institutions, capabilities and people's needs.



Citizen experience is the ultimate barometer

What should digital transformation deliver?

What effective governance must deliver

Quality services, dependable scheme delivery and quality public infrastructure.

Value for public money and citizens' time, with transparent expenditure and results.

Coordinated departments and decisions informed by data.

Inclusive, rights-based governance that treats citizens as partners

What citizens expect

Reliable services: transparency, predictable timelines and efficient delivery.

Easy access: simple, affordable and accessible services, including for those who need assistance.

Responsive governance: rule of law, accountability, meaningful participation and continuous improvement.

The Digital Government Standard: consistent quality across services, decisions, programmes and public infrastructure.

Two complementary dimensions of digital transformation

We have islands of digital excellence. The challenge is to make that quality consistent across the government.

1. Deepen transformation within sectors

Transform service delivery and governance through redesigned processes, digital workflows, clear stakeholder responsibilities and defined timelines—with citizen experience at the centre.

Address entrenched practices and resistance through leadership and willingness to reform.

Build institutional ownership and capacity to implement and sustain change.

2. Create a unified citizen experience across government

Connect departmental applications around complete citizen journeys.

Reduce separate interfaces, repeated information requests and inconsistent timelines.

Establish common service standards and accessible pathways for independent and assisted users.

Institutions must drive reform. A shared digital architecture must connect systems. Both must deliver a better citizen experience.

Digital government requires deliberate design

Model	Principle to carry forward
Estonia	Life-event services and interoperable data, supported by organisational, legal, fiscal and technology arrangements.
Singapore	An integrated approach to government and citizen experience across services.
India Stack and digital payments	Shared digital capabilities and interoperability that support multiple services and providers.
ILGMS and K-SMART	Kerala's experience of integrating local-government functions, connecting sectoral reform with a wider One Government approach.

Good citizen experience requires deliberate coordination across institutions, processes and systems.

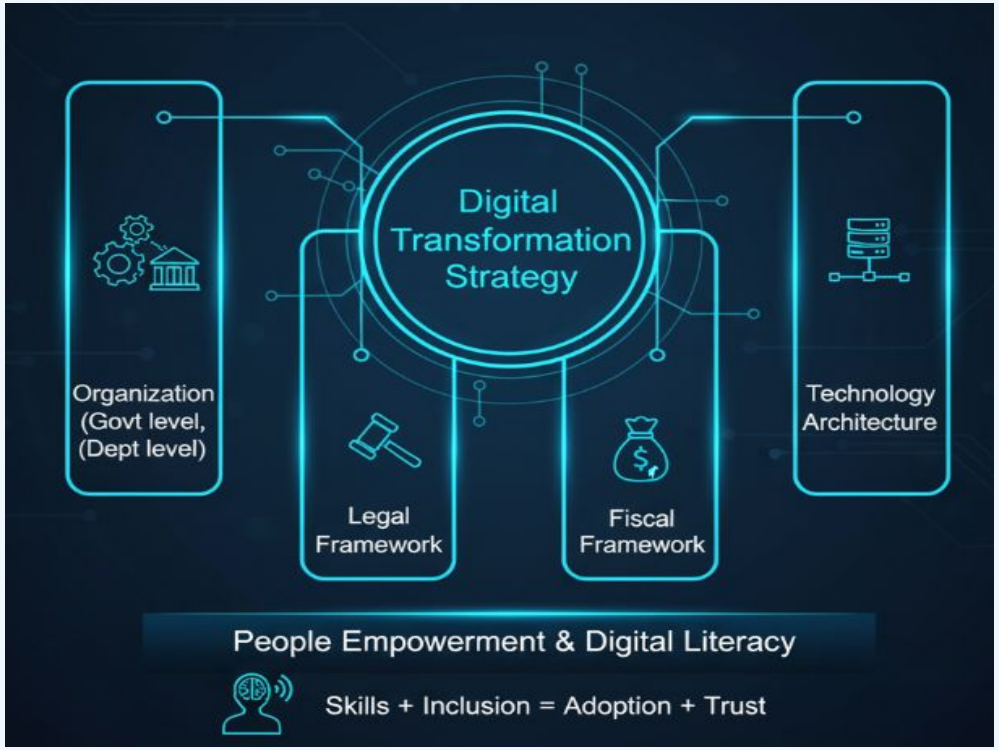
The next question is how to organise that coordination in practice.

The lesson: design the whole system while delivering practical improvements

A practical framework for transformation

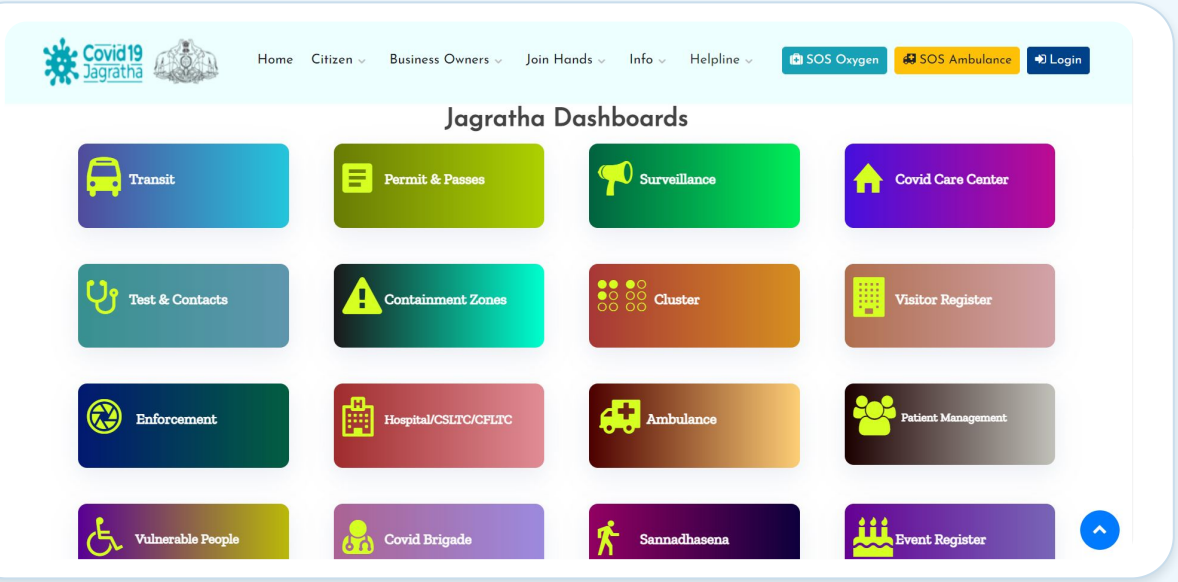
Dimension	Questions for implementation
People and empowerment	Have citizens, frontline staff, users and influential stakeholders shaped the solution **as per their needs**? Have they taken ownership of implementation? Do they have the capability, support and confidence to sustain its use?
Technology architecture	Is the technology appropriate to the task and field conditions? Do applications, data and shared capabilities meet functional needs and work together securely and reliably?
Governance	Is there a task-oriented governance structure at every level needed for delivery? Does it combine democratic participation, clear authority and accountable coordination? Are the necessary policies, legal provisions and monitoring arrangements in place?
Fiscal arrangements	Are sufficient resources available for design, implementation and continued operation? Are approvals, timely releases and predictable fund flows arranged so that delivery is not interrupted?

Digital transformation requires a clear vision, careful planning, appropriate architecture and mission-mode execution—with citizen experience as the measure of success.



Process redesign runs through all four dimensions.

COVID Jagratha: the framework in action



A comprehensive, adaptable pandemic management solution

Connected surveillance, quarantine, testing, contact tracing and containment-zone management.

Coordinated hospitals, first-line treatment centres, patient care, beds, ambulances and oxygen supply.

Agile development by a small NIC core team, with additional support, enabled rapid adaptation to changing field needs.

A governance structure from the community to the state

Ward → Local govt → District → **State war room**

Ward-level response teams and local self-governments linked to district coordination and the state war room.

Defined responsibilities, operational support and continuous monitoring connected decisions with field action.

Data informing operations and policy

Connected patient needs and available resources to guide timely allocation and response.

Informed policy adaptation, supporting **"living with COVID"—managing health risks while enabling daily life to continue.**

ONE ADAPTABLE SYSTEM CONNECTED

Surveillance · Quarantine · Testing · Contact tracing · Containment zones · Hospitals · First-line treatment centres · Beds · Ambulances · Oxygen

The lesson: appropriate technology, a responsive governance structure and data-informed decisions must work together.

e-Health: understanding the reality of work

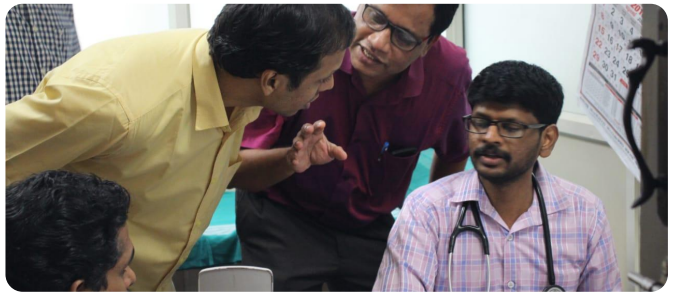
A stalled project –and a demanding clinical setting

- An outpatient pilot across 12 hospitals had not succeeded; computers remained unused.
- Patients queued from the night before. Doctors had little time for data entry, and software did not fit clinical workflows.



Understand the work before redesigning the system

- User studies across hospital tiers examined patient flows, consultation time, staff responsibilities and functional needs.
- Addressed workload concerns through design and support, and resistance to loss of discretionary control through transparent rules and leadership.



Redesign the product and workflow together

- Connected online outpatient booking, reception, queue management and digital consultation.
- Refined the hospital system and consultation interface through user feedback, domain expertise and usability studies.
- Improved patient flows while supporting doctors' work; digital consultation



Adoption follows when the system helps staff do their work and makes care easier for patients.

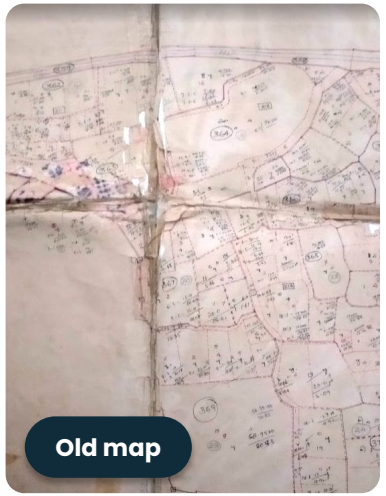
Ente Bhoomi: accurate records as the foundation

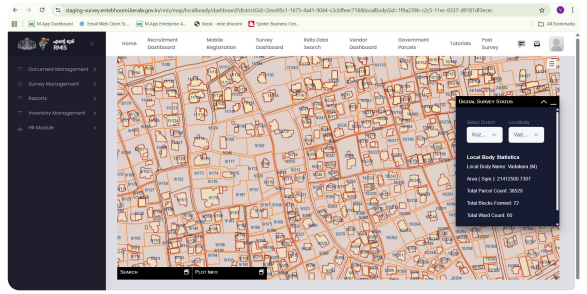
A longstanding administrative puzzle

- Inaccurate or outdated records forced citizens to visit multiple offices to establish authenticity and obtain land-related services.
- Survey, Revenue and Registration held different parts of the records and transaction process; maps and textual particulars were not consistently aligned.
- Computerising existing records could not correct inaccurate maps or ensure timely updates after transactions.

Accuracy as the foundation of reform

- Create precise parcel maps with reliable coordinates, linked to textual records through a common parcel identity.
- Design for accuracy, speed, cost, completeness and future maintenance.
- Build public confidence through accurate measurements, transparent verification and resolution of differences with existing documents.





Spatial map + Textual record = Common parcel ID

Beyond surveying—to transformed land services

The goal: accurate, authentic and continuously updated land records

Ente Bhoomi: the transformation framework in action

People and empowerment

Trained departmental and contract survey teams with the capacity and support to implement the programme.

Survey Sabhas and Survey Jagratha Samithis enable citizen awareness, participation and ownership.

Citizens can view records, verify particulars and submit grievances online.

Governance structure

State and district project management with defined responsibilities and operational support.

Revised procedures and enabling policy changes support implementation and institutional coordination.

Live WebGIS and field dashboards enable continuous monitoring of progress and quality.

Technology and architecture

CORS-supported GNSS RTK and robotic total stations integrated into a common field workflow.

End-to-end digital processes: preparation, measurement, quality checks, correction, approval and public viewing.

A common parcel identity connects Survey, Revenue and Registration, with integrated transactions designed to keep maps and textual records updated.

Fiscal framework

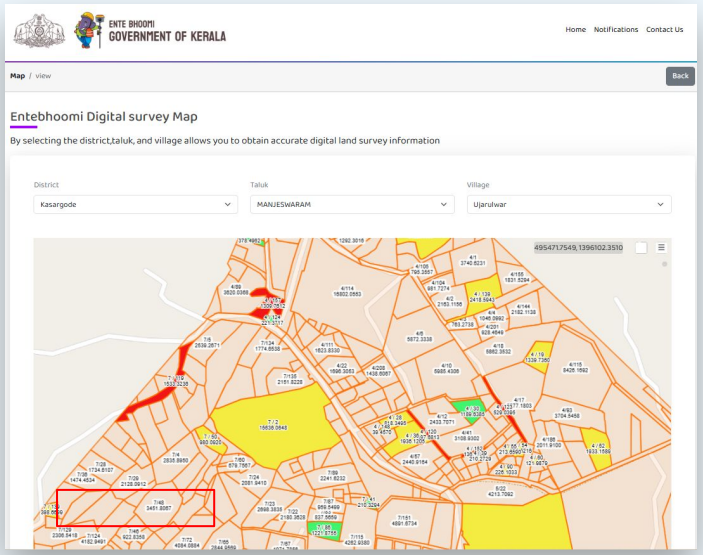
Sustained funding for technology, survey teams, training and programme support.

Timely availability and flow of funds to maintain implementation continuity.

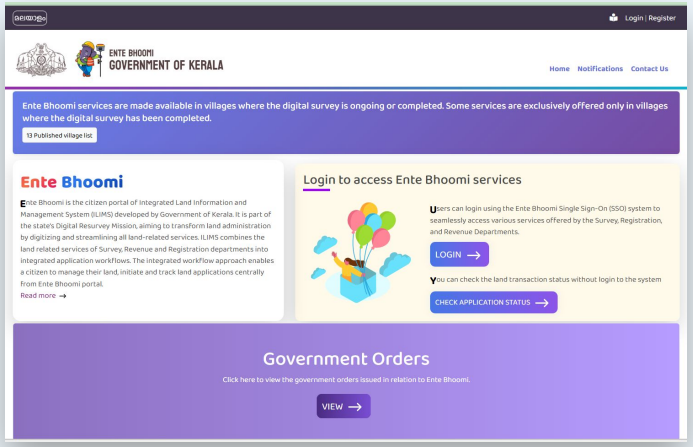
Accurate surveying becomes lasting reform when people, technology, governance and funding work together—and records remain current

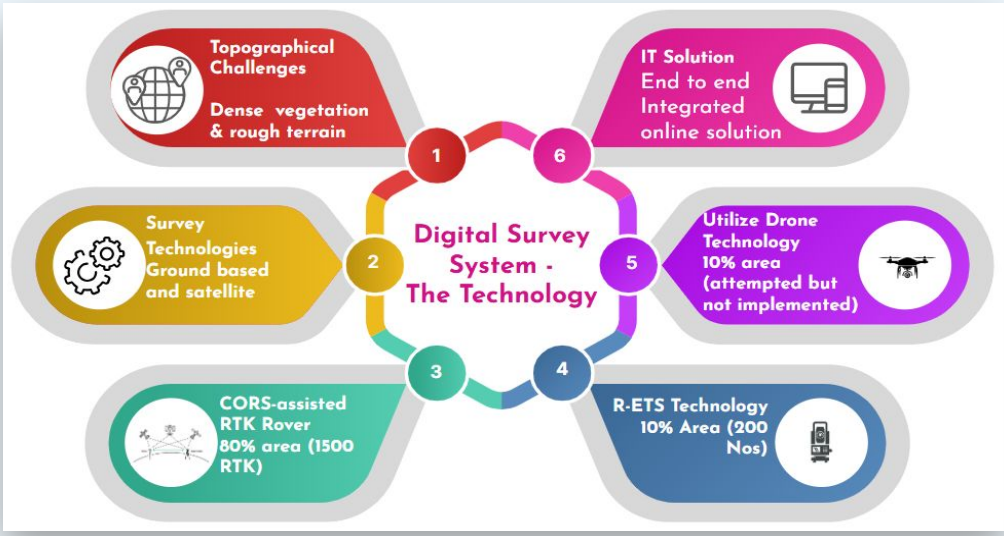
Ente Bhoomi: the framework in action











Accurate surveying becomes lasting reform when people, technology, governance and funding work together — and records remain current.

Digital land survey at a glance

AREA SURVEYED

10.62 lakh ha

≈ 1.06 million hectares

27.4% of total state area

LAND PARCELS COVERED

73.67 lakh

≈ 7.4 million parcels

22.7% of 3.25 crore (32.5 M) parcels

VILLAGES – SURVEY INITIATED

839 / 1,666

villages

50.3% of all villages in Kerala

ACTIVE FIELD SURVEY

600 / 839

villages

71.5% of survey-initiated villages

SURVEY PROGRESS – VILLAGE-WISE (of 1,666 villages)

Total villages in Kerala	1,666	100.0%
Survey initiated	839	50.3%
Active field survey started	600	36.0%
Survey in progress	215	12.9%
Section 13 notification published	266	16.0%
Section 9(2) notification published	119	7.1%

ACHIEVEMENTS SO FAR

- High-accuracy survey using CORS network, RTK, electronic total stations and drones
- Integrated ILIMS (Integrated Land Information Management System) portal services across 266 villages
- 25,000+ land registrations processed through ILIMS
- Strong institutional set-up, trained workforce and technology ecosystem

Kerala: 38,863 km² total area · 12,994 km² forest (33.4%) · digital survey covers 10.62 lakh ha (27.4%).

Ente Bhoomi - Informed & Guided Land Governance System

ILIMS PORTAL SERVICES

Unified Platform
All Revenue, Survey & Registration services in one place (Ente Bhoomi)

Pay Land Tax
Online payment from home

Download Land Records
Instant PDF download

Location Sketch
Geo-coded sketch integrated with maps

Digital Pre-Mutation Sketch
Eliminates future property disputes

Instant Mutation
Mutations updated instantly after deed registration

E-BTR & Legacy Records
Download certificates & legacy records online

Complaint Lifecycle
LRM issues resolved digitally within 30 days

Access via Akshaya Centers & Licensed Document Writers
Ensuring digital inclusion for all

Control Center & Toll-Free Support
Real-time guidance & query resolution
1800 425 5080

ENTE BHOOMI

INTEGRATED LAND INFORMATION AND MANAGEMENT SYSTEM (ILIMS)

SCHEMATIC ARCHITECTURE



ENTE BHOOMI CITIZEN SERVICES

Profile	REVENUE	REGISTRATION	SURVEY
A	B	C	D
User Registration	Pay Tax	Sale Transaction	Digital survey
Profile Updation	LRM Complaints	Settlement Transaction	Verify land records
Registration for Document Writers	Succession Transaction	Gift Transaction	Land complaints during Digital Survey
View digitally surveyed land records	WILL Transaction (Closed/ Registered/ Unregistered)	Partition Transaction	Sale of scanned Survey Records
Delegate land parcels to other users	Land Assignment	Exchange Transaction	Land parcel Maps
profile sharing to other users	Land Acquisition	Release Transaction	
Aadhaar Authentication	Land Relinquishment	Cancellation Transaction	
FIDO	Revenue Sale	Rectification Transaction	
	Court verdicts	Transactions of Trust	
	Revenue Court	Trust Revocation	
	Location Sketch	Encumbrance Certificate	

Nammude Keralam: one comprehensive governance platform

Citizen service delivery

One place to discover services, understand requirements, submit applications, make payments and track progress.

Citizen assistance

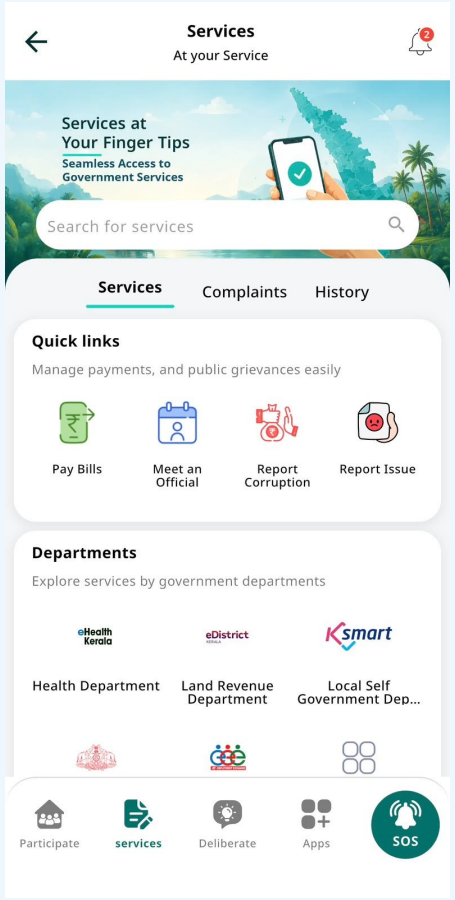
Get guidance and timely notifications, book appointments with officials, report issues and seek grievance redressal.

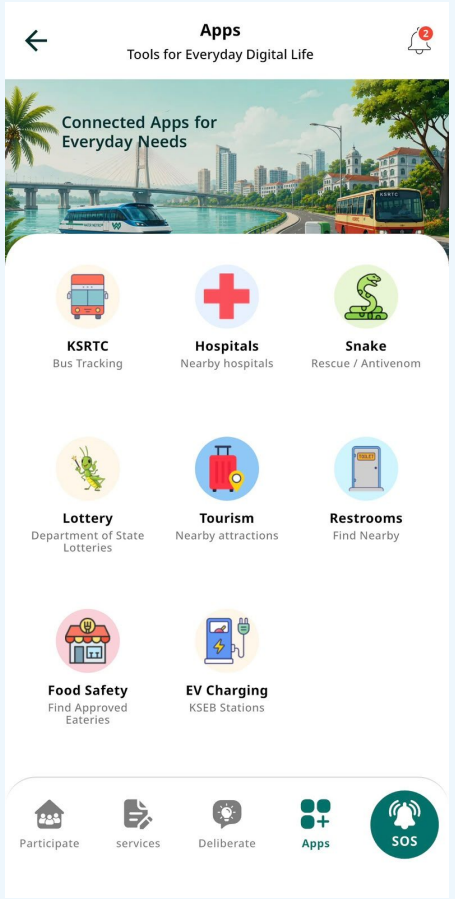
Citizen participation

Contribute ideas, participate in discussions and polls, shape public initiatives and join collective action.

Nammude Apps - tools for everyday digital life

Access useful applications and location-based information that support daily needs, alongside government services.





From separate departmental interfaces to one consistent citizen experience—with simple access for independent users and support for those who need assistance.

Service First · Mobile First · Malayalam First · One Government

A common architecture for better services and better governance

Connect systems that evolved separately

- Make Digital Kerala Architecture the common framework connecting existing departmental systems, shared applications and the citizen interface.
- Build on shared registries—including an infrastructure registry—a secure data exchange platform, and common services for identity, documents, payments and notifications.

Make information work across government

- Apply the "provide once, reuse when authorised" principle: citizens should not repeatedly submit information already available with government.
- Enable departments to exchange verified information securely, coordinate workflows and reduce duplication—improving service delivery, planning and decision-making.
- Give citizens simpler applications, pre-filled information they can review and correct, and clear progress tracking.

Make the architecture operational—and enable AI on top

- The immediate task is to make these connections work in practice, with clear departmental responsibilities, common standards and safeguards.
- Build towards AI-assisted services in familiar language: help people find the right service, understand requirements and complete applications with minimal effort.
- Make independent access easier and more intuitive, while strengthening assisted delivery for those who need support.
- Success means more completed services, less time and effort for citizens, and better coordination across government.

Four experiences. One transformation framework

e-Health

Understand people's work; redesign the technology and the workflow together.

COVID Jagratha

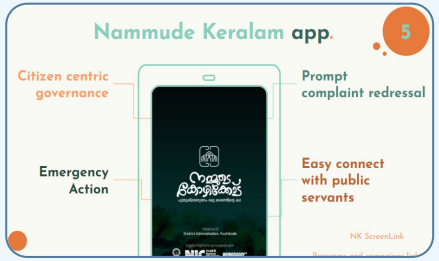
Connect a comprehensive digital solution, field governance and data-informed decisions.

Ente Bhoomi

Build accurate records, secure citizen confidence and connect institutions to keep records current.

Nammude Keralam

Bring departmental systems together around complete citizen journeys and a common service standard.



What makes transformation possible?

People who own the change • Appropriate technology and architecture • Governance suited to the task • Sufficient funding with dependable financial flows

The framework can travel across contexts. Its application must fit local institutions, capabilities and people's needs.

From digital projects to dependable digital government

1 Transform systems through coordinated reform

Bring people, technology, governance and funding together to improve records, redesign processes and strengthen institutions.

2 Connect systems around complete citizen journeys

Use a shared digital architecture to connect departmental workflows, enable secure data exchange and deliver a consistent citizen experience.

3 Use AI to improve access and assistance

Help citizens discover services, understand requirements and complete applications in familiar language—independently or with support.

4 MEASURE WHAT CHANGES IN PEOPLE'S LIVES

- **Easier services**
- **Better public decisions**
- **Effective programmes**
- **Quality infrastructure**
- **Meaningful participation**

Make this quality consistent across government—and sustain it through institutional ownership, reliable funding and continuous improvement.

Citizen experience is the ultimate barometer of effective governance.

Simplifying Land Administration
Enhancing Efficiency
Ente Bhoomi

Thank You

Transforming Complex Systems
Improving Citizen Experience
Lessons from Kerala and India

COVID Jagratha Samithi | Nammude Keralam | e-Health Kerala



Seeram Sambasiva Rao, IAS
Government of Kerala