Leveraging the power of ICT for Good Urban Management

Smart Cities
From Good to Smart ...Transforming Urban Management in India
ICT for Effective City Management

• **ICT synergizing with Emerging Technologies** is transforming businesses and societies in a significant way.

• **ICT is bypassing cities** and the way cities are managed.

• JnNURM 1 has promoted e-governance – focusing on 8 areas
  – B&D certification, property tax, payroll and personnel, e-procurement, *building plan approval*, water and utility payments, SWM, grievance system, trade licenses, project and ward works
  – Benchmarks are defined

• Large scale investments needed in urban sector (HPEC, 12 FYP) – Innovations are a must

• Innovation through ICT – improving service, reducing costs, process time, productivity gains etc

• Capitalizing ICT revolution for better urban governance and service delivery
Mobile Subscription

![Graph showing mobile subscriptions by GDP per capita category from 1998 to 2009. The y-axis represents average mobile subscriptions per 100 inhabitants (weighted by population), ranging from 0 to 120. The x-axis represents years from 1998 to 2009. The graph includes five categories: Poorest, Poor, Middle, Rich, and Richest. The categories show increasing trends over the years.](image-url)
Internet usage

Internet Usage by GDP per Capita Category

Average Internet Users per 100 Inhabitants (Weighted by Population)


Poorest
Poor
Middle
Rich
Richest

CDI, Univ. Manchester & ITU
Urban Infrastructure investment requirement of Rs. 39.2 lakh crore over 20 years.

- Additional Rs 20 lakh crore for operation and maintenance of assets – old and new
ICT for Effective City Management

• Imperative to promote ICT – for cost efficiency and service delivery improvement
• ASCI in partnership with Ministry of Urban Development, GOI and technology thought leaders is promoting ICT innovations in City Management
  – Efficiency improvement
  – Transparency
  – Cost reduction
Evolution ….. From “Good” to “Smart”

- Early phases focused on “IT for Computerization”
- Next phase looked into integration as adaptive and intelligent cities using “ICT for e-Governance”
- The current generation cities look at “ICT with Emerging Technologies for building Smart Cities” (ICT, Electronics and Sensor based, GIS, GPS based, Real-time Systems, Mobile, Analytics based etc.)

Inception | Good Governance | e-Governance | Smart Governance

1990s
- Information via Cities ‘ websites

2000s
- City portals for Online information services

2004/5
- INTELCITIES
- Online web-based eLearning system integrated & inter-operable with other cities’ platforms

2005+
- SMART CITIES
- Having an e-learning, participatory governance, support digitally inclusion, Intelligent buildings, Energy & environment efficient, Carbon emission & pollution controlled
ICT development

Limited Progress
- Water Management
- Sewerage
- SWM
- Lighting
- Traffic and Transportation

Partial Progress
- Personnel Info Sys
- Revenue Mgmt
- Projects/Works Mgmt
- Accounts
- Health Mgmt
- Town Planning
- General Admin

Significant Progress
- Grievance Mgmt system
- Town planning
- Information through web portal

Internal processes

Service Delivery

Citizen interface
### Potential ICT Application Areas in Urban Management

<table>
<thead>
<tr>
<th>Water Supply</th>
<th>Waste Water</th>
<th>Solid Waste Management</th>
<th>Municipal Services</th>
<th>Revenue &amp; Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resource Management</td>
<td>Plant Management</td>
<td>Attendance Monitoring</td>
<td>Birth &amp; Death Certificates</td>
<td>Property Tax</td>
</tr>
<tr>
<td>Distribution Management</td>
<td>Collection &amp; Distribution</td>
<td>Bin Tracking System</td>
<td>Building Plan Approval</td>
<td>e Procurement</td>
</tr>
<tr>
<td>Internal Business Process</td>
<td>Billing and Collection</td>
<td>Vehicle Tracking System</td>
<td>Grievance Management</td>
<td>Accounting system</td>
</tr>
<tr>
<td>Billing &amp; Collection</td>
<td>Grievance Handling</td>
<td>Treatment and Disposal</td>
<td>Licenses</td>
<td></td>
</tr>
<tr>
<td>Grievances Handling</td>
<td></td>
<td>Internal Business Processing</td>
<td>Traffic</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Citizen’s Grievances</td>
<td>Street Lights</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>Flooding</td>
<td></td>
</tr>
</tbody>
</table>
Smart cities are built around six dimensions integrating all aspects of Urban Management:

- Smart Governance
- Smart Mobility
- Smart Living
- Smart Economy
- Smart Environment
- Smart People
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Smartness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking</td>
<td>Identifying Free parking slots, Navigating to a parking thru Maps</td>
</tr>
<tr>
<td></td>
<td>Booking for slots based on travel plan, Payment from your Mobile</td>
</tr>
<tr>
<td></td>
<td>Proactive Creation of Parking spaces</td>
</tr>
<tr>
<td>Solid waste</td>
<td>Free of garbage, Auto Alerts on Garbage to pick-up trucks</td>
</tr>
<tr>
<td></td>
<td>to inform the administration if they are not cleared</td>
</tr>
<tr>
<td></td>
<td>enforcement for unauthorized garbage dumping</td>
</tr>
<tr>
<td>Parks and lakes</td>
<td>Walk ways, Green lawns watering regularly,</td>
</tr>
<tr>
<td></td>
<td>Alarms on tress-passing, smart lighting based on ambient light, garbage maintenance</td>
</tr>
<tr>
<td>Toilets</td>
<td>Locating Toilets thru maps, Auto flushing, paid toilets</td>
</tr>
<tr>
<td>Streets</td>
<td>Lighting solar, Pollution information, Free corridors</td>
</tr>
<tr>
<td></td>
<td>Signage and bulletin boards</td>
</tr>
<tr>
<td>Governance</td>
<td>Single sign-on, citizen participation in policy</td>
</tr>
<tr>
<td>Safety, security and</td>
<td>Acoustic video Surveillance and noise based titling camera</td>
</tr>
<tr>
<td>Disaster management</td>
<td>ID, device and access security,</td>
</tr>
<tr>
<td></td>
<td>Bulletin boards and broadcasting systems for alerts, alarms</td>
</tr>
<tr>
<td></td>
<td>Surveillance on thefts and chain snatching and disaster</td>
</tr>
<tr>
<td>Utilities (Water, Electricity etc)</td>
<td>Information, Alerts. Payments, service timings, shutdown</td>
</tr>
<tr>
<td>Communication</td>
<td>Connected , wifi etc, Ubiquitous access to internet</td>
</tr>
<tr>
<td>Information</td>
<td>Access to information about almost anything</td>
</tr>
<tr>
<td>Mobility</td>
<td>Info on public transport, booking, traffic situation / congestion</td>
</tr>
</tbody>
</table>
Some smart initiatives

• Smart mobility – HTRIMS, Hyderabad; Bangalore
  – Bicycle sharing program, Trivandrum
  – Bus information system over mobile

• Water efficiency through SCADA – Pimpri Chinchward

• Building approval system – AUTO DCR – about 30 cities

• Integration of services and governance – Hyderabad

• Smart toilets – sensor based community toilets – Trivandrum

• Automatic meter reading – Mumbai, Hyderabad

• Solid waste information system - GHMC
**Smart Initiative by Hyderabad Traffic**

**Smart Mobility**

"HTRIMS"

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**Hyderabad Traffic Context**

- 29 lakh vehicles on road in Hyderabad, fourth largest in India
- 600 vehicles added every day
- Almost no footpaths
- Hyderabad has only 8% of city as road area as against 14%-18% in other metros
- Vehicle density 723 vehicles / km, second largest in the country
- Average speed at 12 kmph against country average of 20 kmph
HTRIMS Highlights

- 221 signals to be automated with central intelligent command center
- 221 signals enabled with Virtual loop cameras for Adaptive Traffic Control and synchronized signals
- Automatic adjustment of the signal timings based on the traffic flows and Adaptive Traffic control
- Automatic signal brightness control based on ambient light
HTRIMS Highlights

- Integration in surveillance on violations
- Variable Message system to alert the citizen on traffic flows and congestions
- Pedestrian controlled signals
- SMS based alerts to citizens
- Optimized traffic flow
HTRIMS Highlights

- Corridor Synchronization for optimized traffic flow

Note: International experience demonstrates Signal synchronization has
1. Improved average travel speed by 50%
2. Reduced delays in road network by 35%
3. Reduced fuel consumption by 22%
AUTODCR – INNOVATION IN BUILDING PLAN SCRUTINY AND APPROVAL
Enabling citizen centric building plan approval through innovative technology
The key issues and challenges
Impact of the challenges

Are the hand-offs between multiple agencies causing inordinate delays in approvals?

Multiple Agencies

Is manual reading of drawings increasing the probability of omission of important checks?

Manual reading of drawings

Are the interpretation of DC rules / Building bye laws becoming subjective?

Complex rules/bye laws

Is inadequate traceability standing in the way of accountability and transparency?

End-to-end traceability

Is a misaligned information flow preventing systemic alerts for corrective/preventive actions?

Information not aligned

How is lack of transparency and citizen interface affecting the image of the corporation?

Inadequate citizen interface
AutoDCR framework

**Architect**
- Submits application online
- Views status online
- Views Reports online
- Final Drawing in .pdf format

**AutoDCR™**
- View sanctioned details

**Higher Authorities**

**MIS Reports**

**Corporation**

1. **Document Approval**
   - Verify the submitted document

2. **Site Visit Approval**
   - Site Inspection Report

3. **Drawing Approval**
   - Drawing scrutiny report generated by AutoDCR™
eGovernance
an efficient way to meet citizen’s expectation

Address:
Computer Department,
Rajkot Municipal Corporation,
Dhebar Road,
Rajkot (Gujarat) - INDIA

Telephone: +91-281-2230920
Fax: +91-281-2224258
URL: www.rmc.gov.in

Rajkot Municipal Corporation
- Brief Details:
  - Governance

- Vacuination
- Property Tax Transaction
- Professional Tax Transaction
- Birth & Death Registration
- Bill Payment to Vendors/Contractors
- Awas Yojna Installment Transaction
- Cheque Return Alert

- Property Tax Outstanding Dues
- Water Charges Outstanding Dues
- Property Name Change
- Property Tax Assessment Request
- Details of SMS Services
- Registration of Mobile No for Property Tax

<table>
<thead>
<tr>
<th>Service</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Property Tax</td>
<td>46,106</td>
</tr>
<tr>
<td>Water Charges</td>
<td>2,166</td>
</tr>
<tr>
<td>Birth</td>
<td>31,676</td>
</tr>
<tr>
<td>Death</td>
<td>13,069</td>
</tr>
<tr>
<td>Awas Yojna</td>
<td>4,245</td>
</tr>
<tr>
<td>Profession Tax</td>
<td>2,688</td>
</tr>
<tr>
<td>RTI</td>
<td>2,580</td>
</tr>
<tr>
<td>FAS (Vendor)</td>
<td>614</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,03,144</strong></td>
</tr>
</tbody>
</table>
m-Governance

Process to Access m-Governance Services

Interactive Service
1. Light <Pole No>
2. Property Tax Due Bill <17 Digit Property No>
3. Water Charges Due Water <13 Digit Water Connection No>
4. Name Change Name <17 Digit Property No>
5. Assessment Request Assess <Name and Address of Property>
6. Complain Status Status <Complain No>

Send SMS to 9624096241

Alert Service
1. Property Tax Register on www.rmc.gov.in
2. Professional Tax Register at the time of registration
3. Awas Yojna EMI collection at the time of creation of master record
4. Birth Registration at the time of registration of birth
5. Death Registration at the time of death registration
6. Vendor/Contractor payment at the time of preparation of bills

Management Service
1. NOD Service
2. Daily Income Expenditure SMS to higher officials every day @8.00 PM
3. Daily Complain statics SMS to higher officials every day @9.00 PM
4. Call Center Service
   1. Complain registered send to officer by SMS
   2. Officer has to change status by SMS only
   3. PND to know pending complain
   4. PND <mobile no> to get pending complain of other officer
   5. ID <Complain No> to details of complain
   6. EDP <Complain No> to know complain is sent to which officer
Vaccination

- Introduced in Nirogi Bal Varsha (Healthy Child Year)
- Vaccination alert to all registered Birth
- Based on National Immunization scheme
- From the age of 7 days to 16 years
- 156331 alerts sent

\[
\begin{align*}
\text{Within 7 days of Birth} & \quad BCG \\
\text{Within 14 days of birth} & \quad OPV-0 \\
\text{At age of 1.5} & \quad DPT-1 & OPV-1 \\
\text{At age of 2.5 Month} & \quad DPT-2 & OPV-2 \\
\text{At age of 3.5 Month} & \quad DPT-2 & OPV-3 \\
\text{At age of 9 months} & \quad Measles & Vitamin-A (Dose 1) \\
\text{At age of 18 Months} & \quad DPT Booster & OPV Booster \\
\text{At age of 5 Years} & \quad DT-5 \\
\text{At age of 10 Years} & \quad TT-10 \\
\text{At age of 16 Years} & \quad TT-16 \\
\text{At 9 Months to 5 Year (Each 6 Months)} & \quad Vitamin-A (Dose 2 to 9)
\end{align*}
\]
## Some Facts and Figures: m-Governance

### Mode of Service – Alert Service

<table>
<thead>
<tr>
<th>Sr</th>
<th>Department</th>
<th>Services for</th>
<th>Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Property Tax</td>
<td>Transaction alert through SMS</td>
<td>36211</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Receipt Cancellation Alert</td>
<td>793</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cheque Return Alert</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Name Transfer Alert</td>
<td>2259</td>
</tr>
<tr>
<td>2</td>
<td>Professional Tax</td>
<td>Transaction alert through SMS</td>
<td>16608</td>
</tr>
<tr>
<td>3</td>
<td>Birth Registration</td>
<td>Birth registration details through SMS</td>
<td>34561</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vaccination alert through SMS</td>
<td>156331</td>
</tr>
<tr>
<td>4</td>
<td>Death Registration</td>
<td>Death Registration details through SMS</td>
<td>14210</td>
</tr>
<tr>
<td>5</td>
<td>Awas Yojna</td>
<td>Installment transaction alert through SMS</td>
<td>33381</td>
</tr>
<tr>
<td></td>
<td>Installment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FAS</td>
<td>Account Payment SMS to Vendors and Contractors</td>
<td>3847</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>298278</strong></td>
</tr>
</tbody>
</table>

### Mode of Service – Payment Reminder

<table>
<thead>
<tr>
<th>Sr</th>
<th>Department</th>
<th>Services for</th>
<th>Beneficiaries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Property Tax</td>
<td>Payment Reminder Service</td>
<td>91,840</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>91,840</strong></td>
</tr>
</tbody>
</table>
Smart City Programme – Action Imperatives

• ICT should be an integral component of future infrastructure and service delivery projects under JnNURM 2 etc
• Pilot projects in select cities – four to five
  – DPR preparation for smart city initiatives
• Explore PPP in innovation and implementation
• Creation of repository of applications and innovations and disseminate extensively (ICT4UD.in)
• Workshops with technology players and encouraging startups for incubation
• Establishing smart city innovation centre
6/5.7 degree separation

- World is highly connected through ICT
- Cities are not leveraging this phenomenon
Thank you

Administrative Staff College of India