Toolkit for Digital Transformation of People-Centered Cities and Communities

11

Module 11:
Smart Sustainable City Governance

Module 11 – Smart Sustainable City Governance

This Module of the Toolkit for Digital Transformation of Cities and Communities focuses on governance and incorporating alignment to the Sustainable Development Goals (SDGs) at the onset of the city or community's digital transformation process.

Cities and communities that are starting on their digital transformation journey will find the resources highlighted within this Module useful toward developing their smart city governance approaches, ensuring that progress toward achieving the SDGs remains a key consideration along their journey.

This Module is also useful for cities and communities that have already made some headway into their digital transformation process but would like to validate their governance strategies.

Module 11 – Smart Sustainable City Governance

This Module will cover the following topics:

1. The Challenges of City Governance
2. Understanding Smart Sustainable City Governance
3. Engaging Stakeholders
4. Measuring Smart City Governance
5. Key Smart City Governance Tools
    1. Tool #1: Creating Smart City Policy
    2. Tool #2: City Science Application Framework
    3. Tool #3: People-centered smart cities framework
    4. Tool #4: Creating Smart City Strategies
    5. Tool #5: Creating Smart Societies

1. The Challenges of City Governance

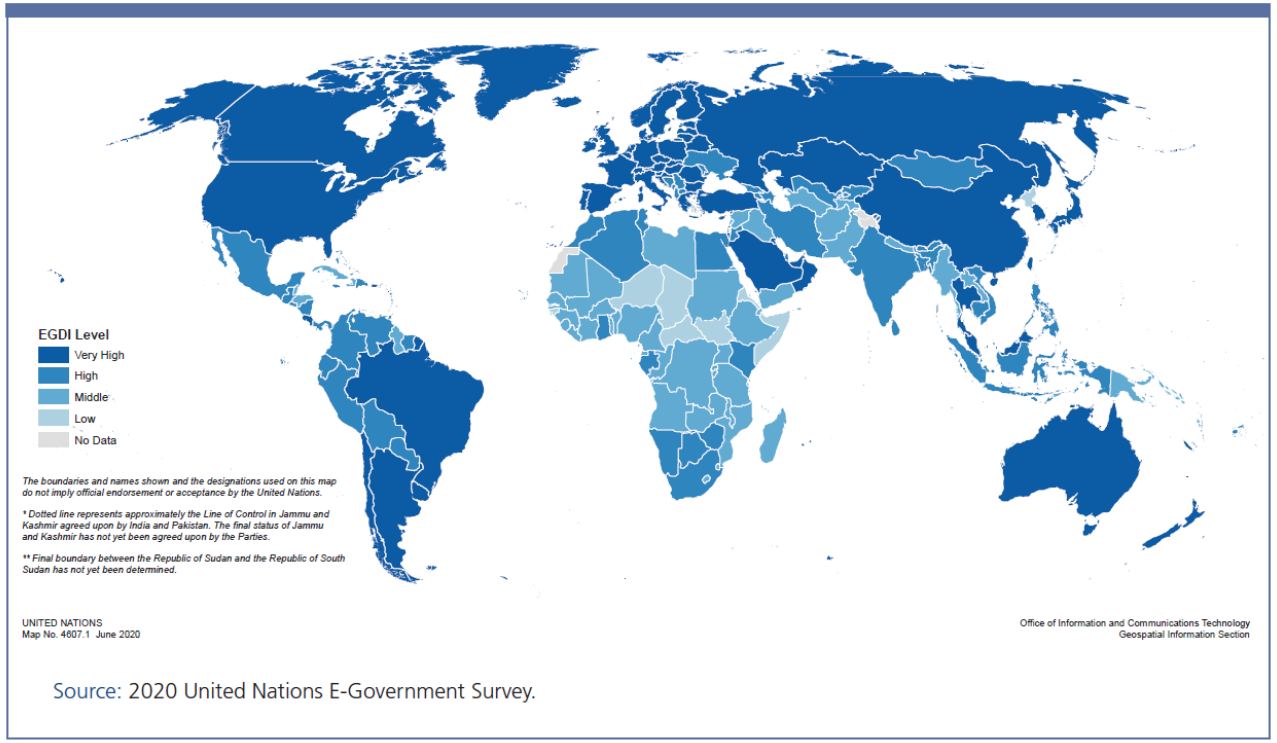
Urban Governance

Governance is emerging as a serious consideration when it comes to the use of advanced digital technologies to drive smart city objectives, especially given the importance of public trust in municipal administration.

Urban Governance Challenges

2. Understanding Smart Sustainable City Governance

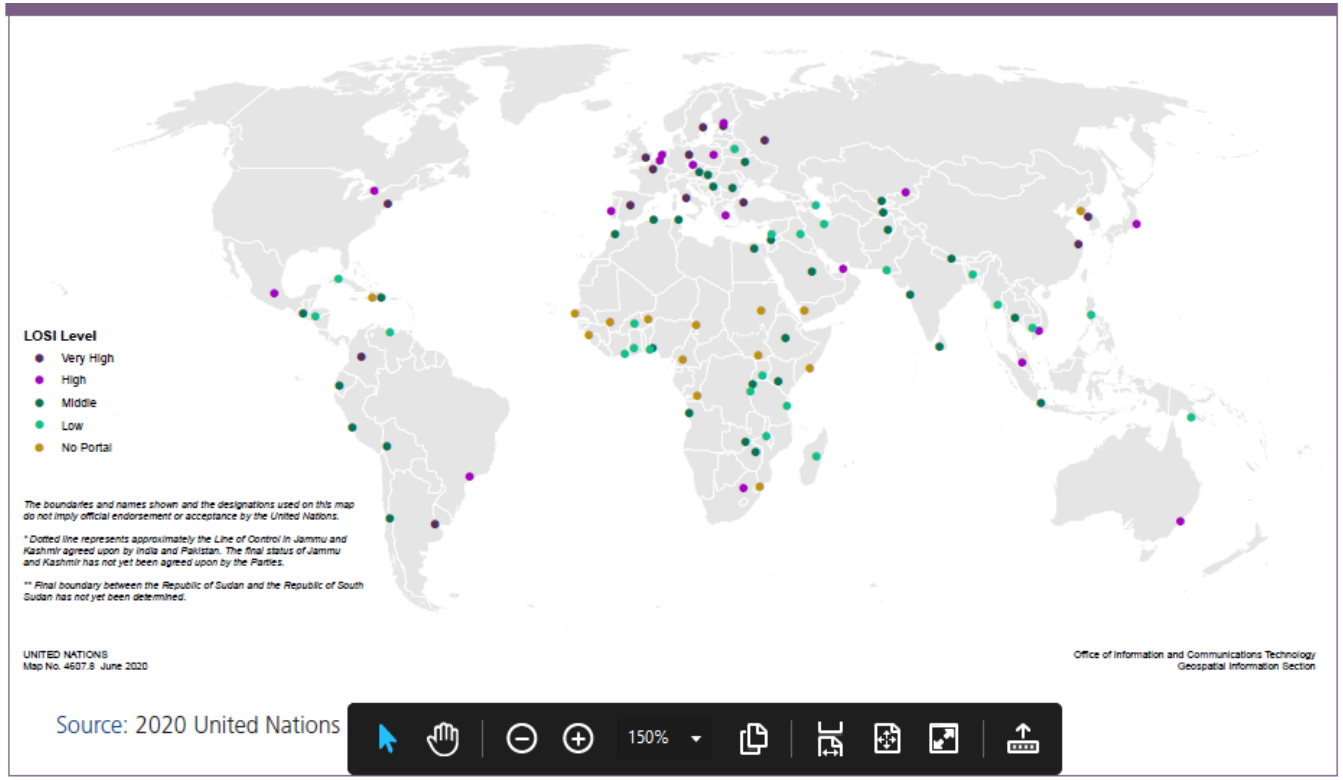
Measuring E-Government Development



Source: 2020 United Nations E-Government Survey.

- Four groups, based on quartiles
- 65% are in the high or very high EGDI group
- More than 22 % moved to a higher group since 2018
- Financial resources, political will, strong leadership get results

Local E-Government



Source: 2020 United Nations

- The city with the highest LOSI ranking is Madrid, followed by New York and Tallinn
- Cities are assigned to levels high, high, medium and low
- While LOSI levels broadly follow income levels there are interesting divergences

Governance Has Been Defined in Many Ways

- “The exercise of political authority and the use of institutional resources to manage society’s problems and affairs” (World Bank, 1991)
- But political authority can be exercised by those inside and outside of government
- Rather, governance is the “collective and concerted efforts by a number of actors to change or influence legal, regulatory, or other issues”(Van Winden, 2008).
- So, governance refers to structures and efforts that go beyond city government and include other social actors.
- Governance is the result of interactions, relationships, and networks between the different sectors (government, public sector, private sector, and civil society) and involves decisions, negotiation, and different power relations between stakeholders to determine who gets what, when, and how.
- Government is one of the actors in governance
- The relationships between government and different sectors of society determine how governance is done

Government vs Governance

Governance is the process of making and implementing decisions in a fair and responsible manner

- Governance is the result of interactions, relationships, and networks between the different sectors (government, public sector, private sector, and civil society) and involves decisions, negotiation, and different power relations between stakeholders to determine who gets what, when, and how

Government is one of the actors in governance

- The relationships between government and the other sectors of society determine how governance is done

Progression of Terms

E-government
- Digital government
- Remote and digital processes

Smart government
- Intelligent government
- Insight, automation

Governance
- Government is not in charge
- More stakeholders are involved

Smart governance
- Intelligent governance
- Smart tools make it possible to work across sectors

What is Smart City Governance?

Components – The tools you have to govern with

- Stakeholders
- Structures
- Processes
- Roles & responsibilities
- Technology
- Policies & regulations

Outcomes – What you want to achieve or change in the city

- Substantive outputs
- Procedural changes

Context – This may constrain or enable what you can do

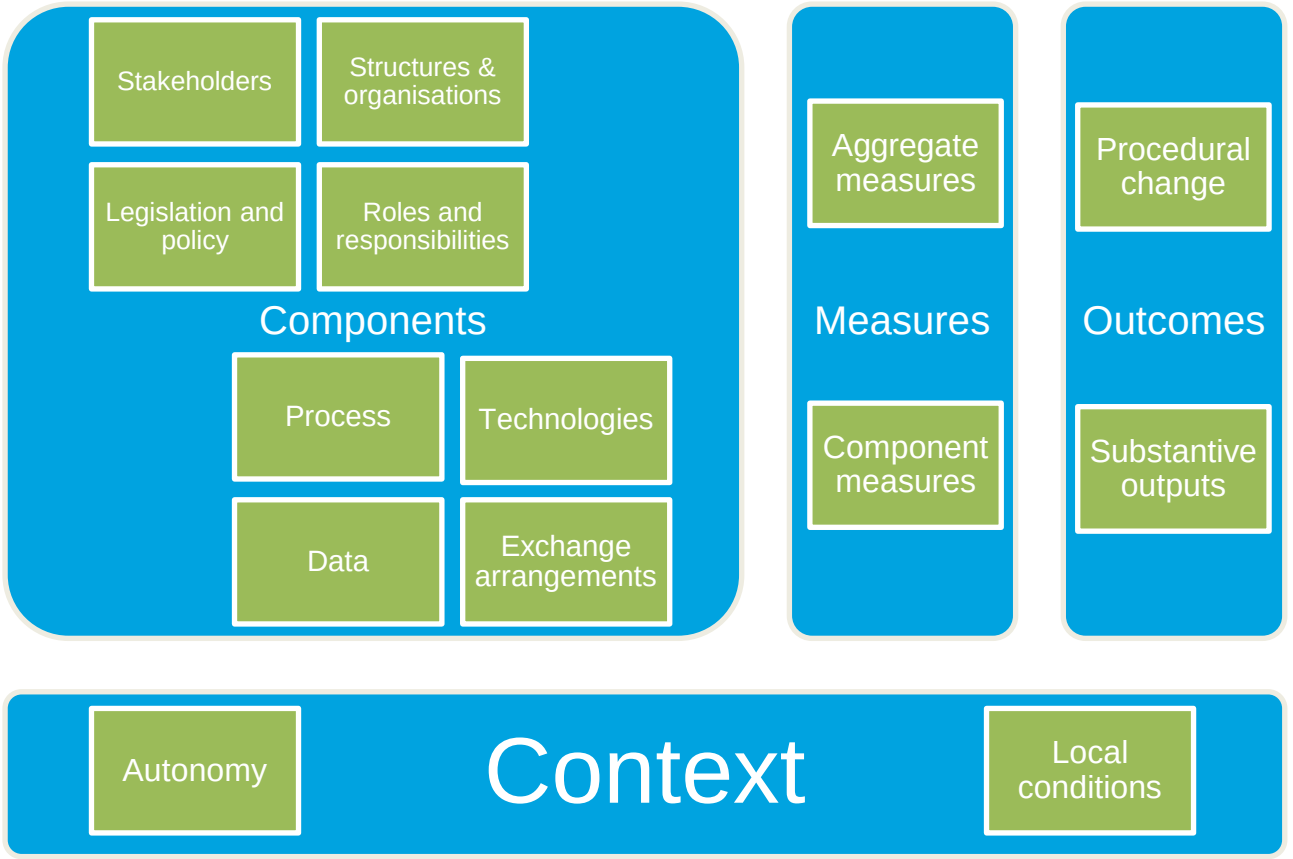
- Degree of autonomy
- Local conditions

Measures-
How you will know if you are making progress

- Aggregate measures
- Component measures

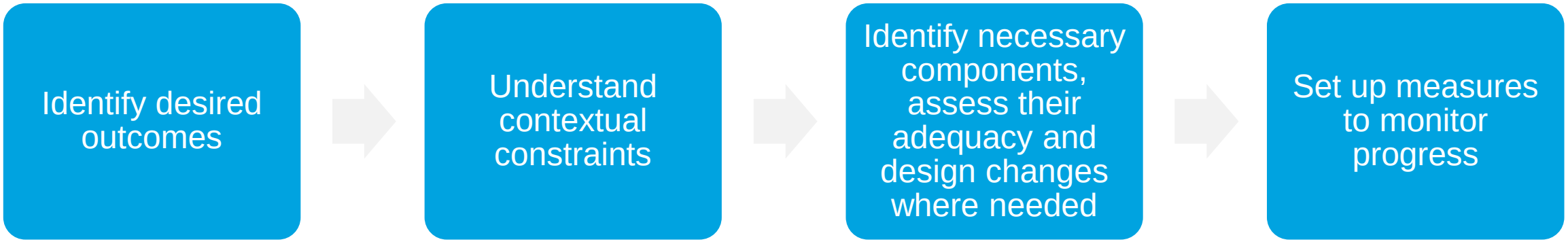
The Components of Smart Governance

- Research has identified these components of smart governance
- This framework can help to understand what elements need attention and how governance functions



Source: Ruhlandt (2018), The governance of Smart Cities, *Cities*

Four-Step Process Towards Smart Governance



Smart Governance Requires Structural Change

Within government

- Reduce or remove silos
- Develop cross-cutting structures

Outside government

- Structures to facilitate engagement (e.g. with professional bodies)
- Structures for participative decision-making
- Public-private partnerships
- Innovation hubs

Factors that Constrain Smart City Initiatives

- Vendor driven and technology-centered approach
- Lack of skills within the public sector
- Lack of coordination within the public sector
- Lack of regulations for data protection, interoperability, ethics, and use of open-source technologies
- Budget constraints
- Lack of policies for digital inclusion
- Resistance to change within the public sector

Smart City Governance Components

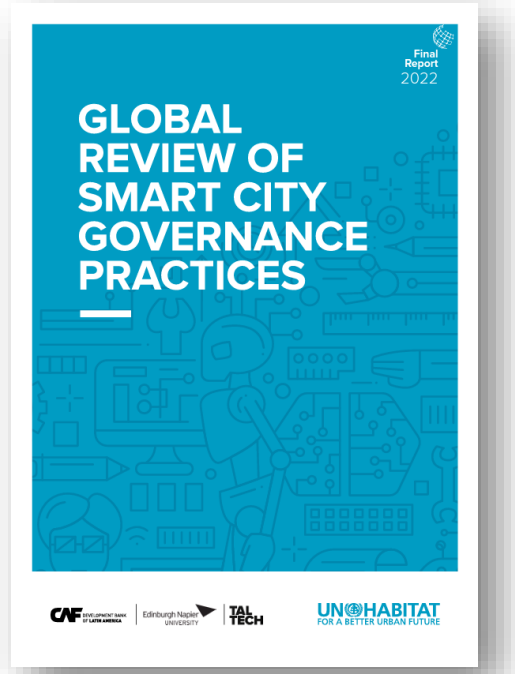
Smart city definition	Smart city vision statement	Smart city objectives and initiatives are aligned with the overall city development goals
A national policy to guide design and implementation of smart city initiatives	A plan to coordinate smart city initiatives	Monitoring the impact of smart city initiatives

Smart City Governance Components

Diverse funding streams for smart city initiatives	Dedicated entity (a unit or a team) that is tasked with overseeing smart city initiatives	Regulations for data protection, interoperability of systems, digital rights, ethics of technology and technology design
Procurement process for digital solutions and data	Process for inhabitant inclusion and participation	Standards for data collection and sharing

Smart City Governance Best Practices – Recommendations

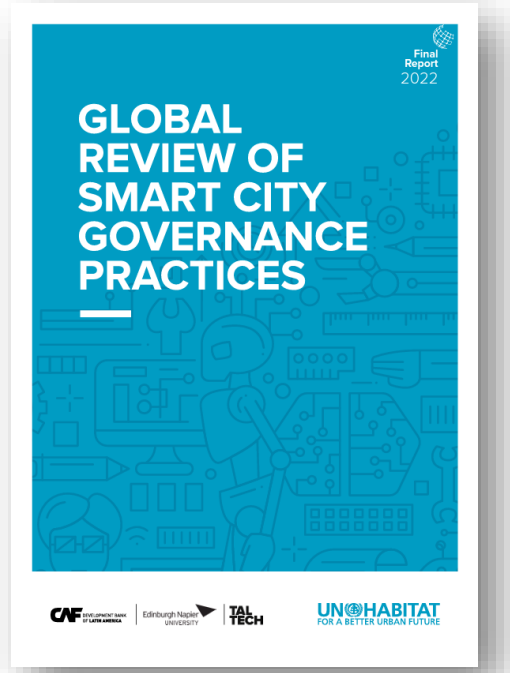
- Take a strategic and active leadership approach to smart city development
- Adopt a people-centered approach
- Set up a smart city unit
- Address the regulatory challenges associated with digital technologies
- Establish smart city partnerships tailored to project and local-context requirements



Adapted from UN-Habitat's report on global review of smart city governance practices

Smart City Governance Best Practices – Recommendations

- Introduce measures to balance the interests and objectives of different stakeholders
- Build capacity for public engagement and for managing smart city services
- Capture, leverage, and transfer relevant practical knowledge
- Focus more the long-term sustainability of smart city services
- Promote system integration, data standards, and interoperability



Adapted from UN-Habitat's report on global review of smart city governance practices

Data for Smart Governance Decision-Making

Data and information can

- Provide a basis for conversation
- Provide a starting point for understanding a situation
- Uncover mistaken beliefs
- Bring stakeholders views together based on facts
- Compare data to increase understanding
- Show what has and has not succeeded in the past

Machine generated knowledge can

- Detect patterns that humans can't see
- Provide ideas for ways to approach a situation
- Show which interventions produce the best results
- Develop and improve algorithms for decision-making
- Automate decision-making

3. Engaging Stakeholders

Governance Stakeholders

Public Sector	Private Sector	Civic Sector
• Municipal bodies • Regulatory bodies • National ministries • Political parties	• Businesses • Professional associations • Industry bodies • Financial institutions	• NGOs • Religious institutions • Cooperatives • Influential landlords

Smart Technology Changes Stakeholder Roles

- Smart technology changes the roles of stakeholders in governance
- It gives a voice to those who have previously been unheard
- It provides information and mis-information that can influence the way stakeholders behave
- It allows for innovation

	Public sector	Private sector	Civic sector
Whose interests?	Public interest (incl. vulnerable)	Shareholder interests	Own interests
Regulation	X		
Co-ordination	X		
Funding	X	X	
Steering	X	X	X
Innovation	X	X	X

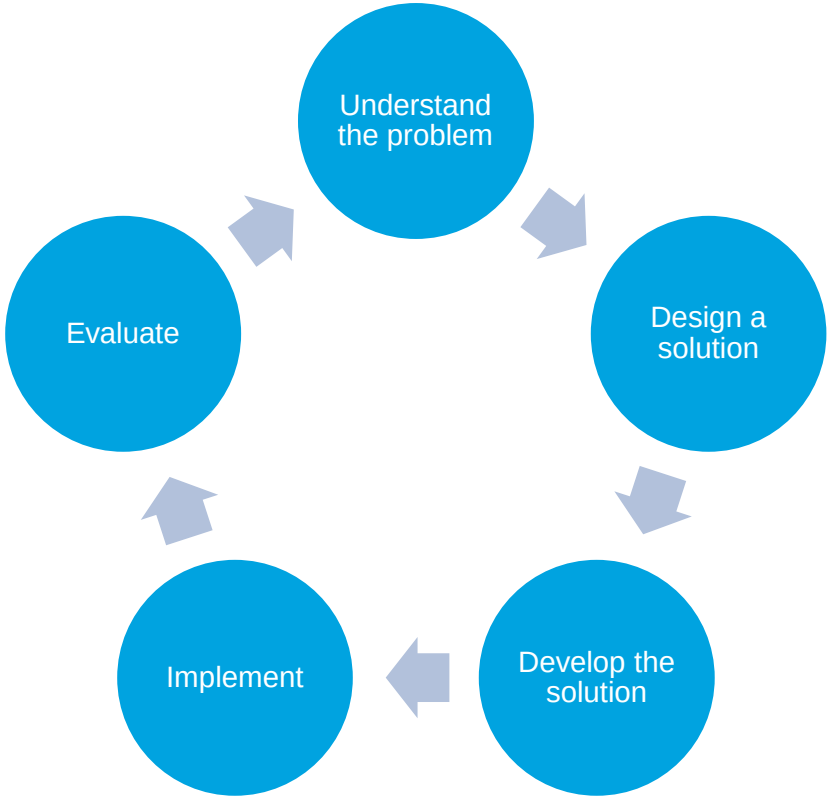
X shows where smart technology has expanded the stakeholder role

Three Levels of Civic Tech

Level	Relationship	Examples
Openness and transparency	Government shares information with residents and businesses. The communication is usually in one direction. Government decides what will and will not be shared and how.	Websites, portals, apps Social media and newsfeeds Open data portals Public sector information policies Accountability and reporting processes
Participation and engagement	Government actively seeks feedback about services, consults and asks public opinion about decisions to be made. Government controls what is presented for discussion, and can choose whether and how to act on feedback.	Feedback and complaint handling tools Public consultations Crowdsourcing Participatory budget platforms e-Petition and digital voting systems
Collaboration, co-design, co-creation, co-production	Government works with stakeholders to identify and understand issues, as well as to craft and implement appropriate solutions. This is (ideally) an equal partnership between government and residents that empowers stakeholders to set the agenda and contribute to solutions.	Initiatives to use and act on open data Deliberative democracy Hackathons Public labs and open innovation initiatives Collaborative design and delivery of public services

Source: CivicTech: Transparency, Engagement and Collaboration for Better Governance, World Bank, 2022

How to Adopt Civic Tech



- The CivicTech solution cycle
- This is an iterative process
- Continuous development of the solution will be needed
- Plan for the entire life-span of the solution
- Discontinuing solutions that are not sustainable erodes trust with stakeholders

Source: CivicTech: Transparency, Engagement and Collaboration for Better Governance, World Bank, 2022

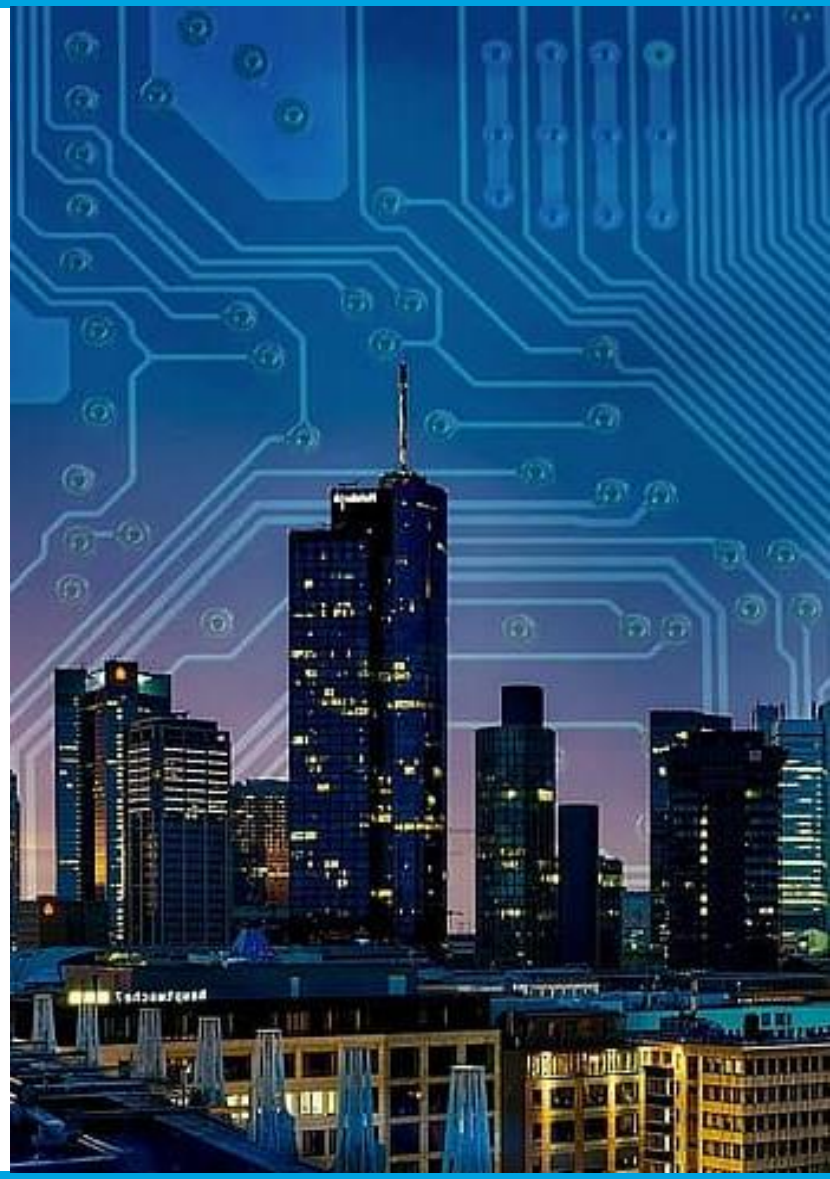
Key Issues for Civic Tech Success

People (representation, conflict, expectations)

Government (communication, responsiveness, effectiveness)

Technology (inclusiveness, scalability, models of development)

Foundations (access, strategy, trust)



Source: CivicTech: Transparency, Engagement and Collaboration for Better Governance, World Bank, 2022

5. Measuring Smart Sustainable City Governance

Uses for City Measures

For this…	Use these…
Simple monitoring	Descriptive models, informational indices are used to track progress over time or against goals
City development	Maturity models, transformational indices, evaluation processes are used to identify areas for improvement and plan changes
Aligning with international or regional goals	Indicator standards that are internationally or regionally defined are used to show progress against global or regional goals (like the SDGs)
Competing for funds or visibility	Competition criteria are used to compete for funds (e.g. India's 100 Smart Cities) and composite indices are used to position cities in high-profile rankings
Competitive benchmarking	Commercial indices are used to guide companies making investments
Prioritising interventions	Intervention assessments are used to evaluate which interventions to implement
Deeper analysis and understanding	Knowledge-building indices, clustering models are used by researchers to understand relationships between interventions and outcomes

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020

Four Types of City Measures

Indicator standards are sets of indicators designed to measure aspects of city performance

Models are maps of city constructs and the relationships between them.

Composite indices assign a single measure to a city based on indicators for city dimensions

Evaluations include tools for evaluating city interventions as well as processes for evaluation

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020

Indicator Standards

- Indicator standards are sets of indicators
- Each indicator measures a particular dimension of a city
- Usually there are several indicators for each city dimension
- Indicator standards ensure that measures are comparable across cities

You can view and search for ITU-T standards at:
https://www.itu.int/en/ITU-T/publications/Pages/structure.aspx

Indicator standards related to cities include:

- ITU-T Y.4902/L.1602 KPIs related to the sustainability impacts of ICT in SSCs
- ITU-T Y.4903/L.1603 KPIs for SSCs to assess achievement of SDGs

ITU-T produce recommendations that are organized into series. Some series that are relevant for smart, sustainable cities include:

- L.1000 – L.1199 E-waste and circular economy
- L.1300 – L.1299 Energy efficiency, smart energy and green data centres
- L.1400 – L.1499 Assessment methodologies of ICTs and CO2 trajectories
- L.1500 – L.1599 Adaptation to climate change
- Y.4000 – Y.4999 Internet of things and smart cities and communities
  - Y.4100 – Y.4249 Requirements and use cases
  - Y.4800 – Y.4899 Identification and security
  - Y.4900 – Y.4999 Evaluation and assessment

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020
U4SSC Key Performance Indicators

Models

Models provide an ideal state for cities to compare themselves with
Can aid planning, as they highlight important dimensions or characteristics of the city

Descriptive models

- Define dimensions and sub-dimensions
- e.g. Boyd Cohen Wheel

- Choice of dimensions may not suit your city

Maturity models

Define development stages

e.g. Scottish Cities Alliance Maturity Model

1. Ad-hoc
2. Opportunistic
3. Purposeful & repeatable
4. Operationalized
5. Optimized

Easy to implement

Models are of poor quality

Clustering models

Use data from many cities to identify patterns

e.g. A study of 35 cities in China identified six patterns of development

Builds understanding of which resource bases and development strategies are most successful

Difficult for cities to use because this analysis requires data from many cities and advanced skills

Could be applied nationally

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020

Evaluations

Competition criteria

- Information provided about what will be assessed, but usually lack detail
- Final assessment completed by a panel of experts
- e.g. European Green Capital award, Smart Cities Challenge (India)

Evaluation processes

- Multi-faceted, structured evaluation processes employing a mix of data sources and approaches
- e.g. World Bank City Strength Diagnostic, World Council on City Data (training & certification)

Intervention assessments

- Evaluate the potential / likely impacts of smart interventions on city functioning
- Use fuzzy logic to make better decisions, identify priority areas
- Difficult to apply without expert assistance

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020

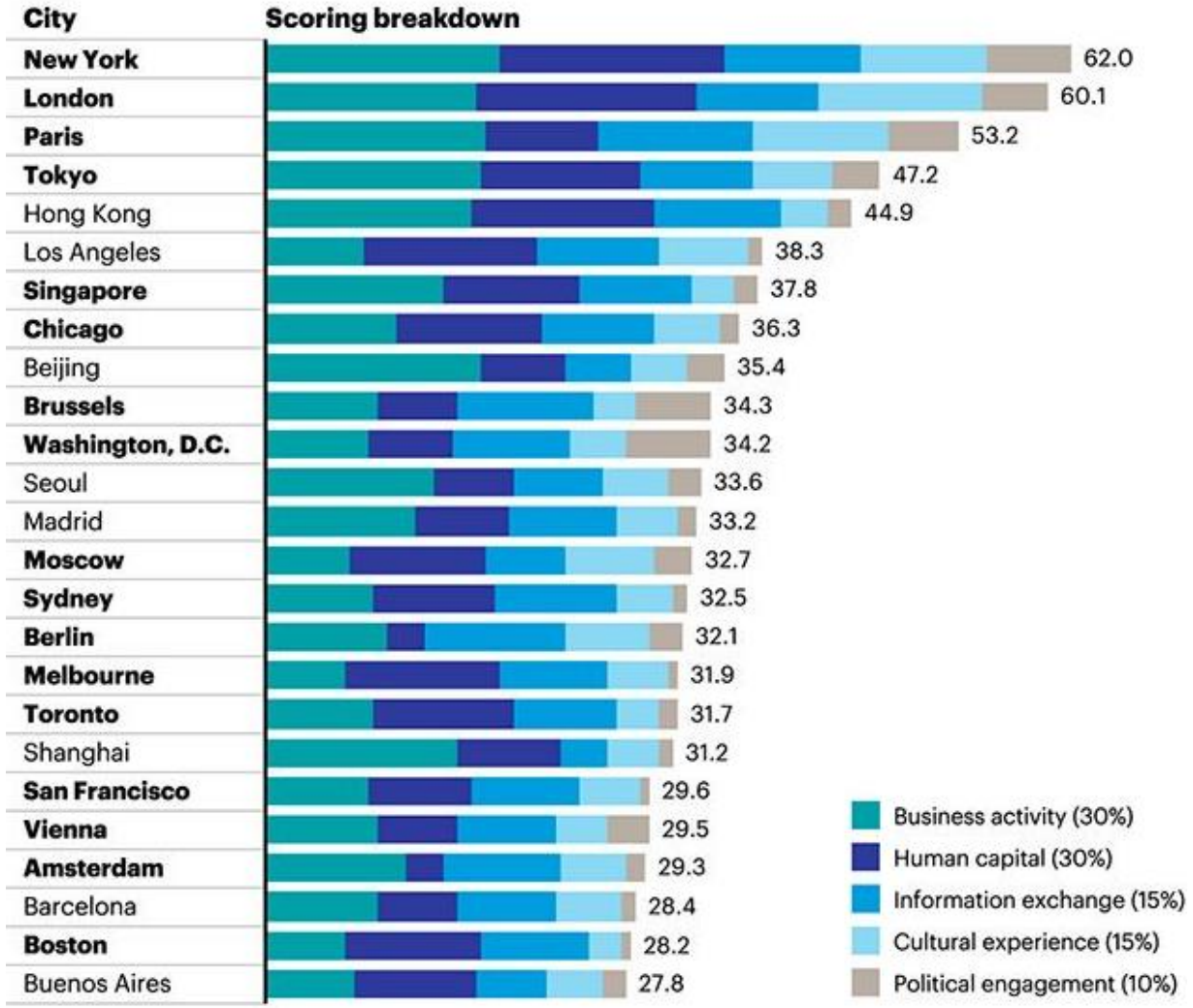
Composite Indices

Composite indices

- Attempt to put a single value on the state of a city
- Make use of a model (for the underlying dimensions)
- Use indicators for each dimension (ideally based on indicator standards)
- Combine indicator values into a single score
- Rank cities (which is useful for visibility and competing, but not always for planning)

The Global Cities Index is shown for 2019, ranking cities based on their global power and influence

Source: Four types of measures for Smart and Sustainable Cities and when to use them, UNU-EGOV, 2020



Source: Global Cities Ranking

5. Key Tools for Smart Sustainable City Governance

Key Smart Sustainable City Governance Tools

Tool #1: Creating Smart City Policy

Tool #2: City Science Application Framework

Tool #3: People-centered smart cities framework

Tool #4: Creating Smart City Strategies

Tool #5: Creating Smart Societies

Tool #1

Smart City Policy

Smart Sustainable City Policy

The SSC policy's purpose can be four-fold:

1. To guide the city's review of SSC planning applications and assessments
2. To provide the basis for approving SSC development applications
3. To inform the city's advocacy role in the SSC planning and development process
4. To assist and enable the city's partners' and stakeholders' contributions to developing the SSC

Some Benefits to Developing an SSC Policy

An SSC policy can help:

Ensure the city's SSC vision

Reconnect human, natural environment, and technological objectives

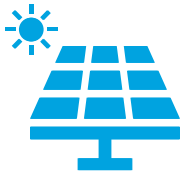
Foster partnership with municipal partners & within the community

Minimize costly future technology and infrastructure remedial measures

Examples of Areas Covered by SSC Policy

Natural system protection & management policies

Policies to address disaster risk reduction



Energy management policies

Water supply management policies

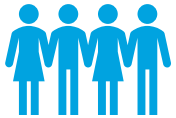
Stormwater management policies

Masterplan and infrastructure policies

Resident service policies

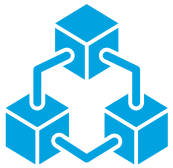
Sustainable communities' policies

Key SSC Policy Principles

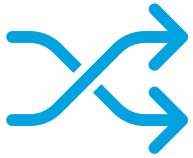


Inclusion

Innovation and investment



Next generation technologies



Interoperability

Global standards and best practices

Privacy and security

Sustainability

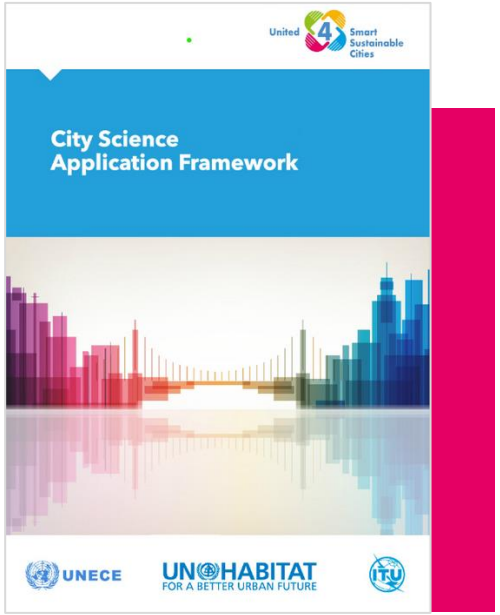
Openness, accountability, and transparency

Tool #2

City Science Application Framework

City Science Application Framework

This publication provides a four-step methodology that cities and communities can follow to determine and implement city science solutions and assess their impacts.



Step 1	Assess the current city science applications status
Step 2	Prioritize & determine city science applications
Step 3	Boost city science applications
Step 4	Assess projected city science applications impact

City Science Application Framework

City science enablers:

RAISING AWARENESS & KNOWLEDGE

STAKEHOLDER ENGAGEMENT & PARTICIPATION

POLICIES & STRATEGIES

CITY SCIENCE R&D PROGRAMS

CITY SCIENCE SKILLS

AWARDS, COMPETITIONS, CITY INITIATIVES (CITY-AS-A-LAB)

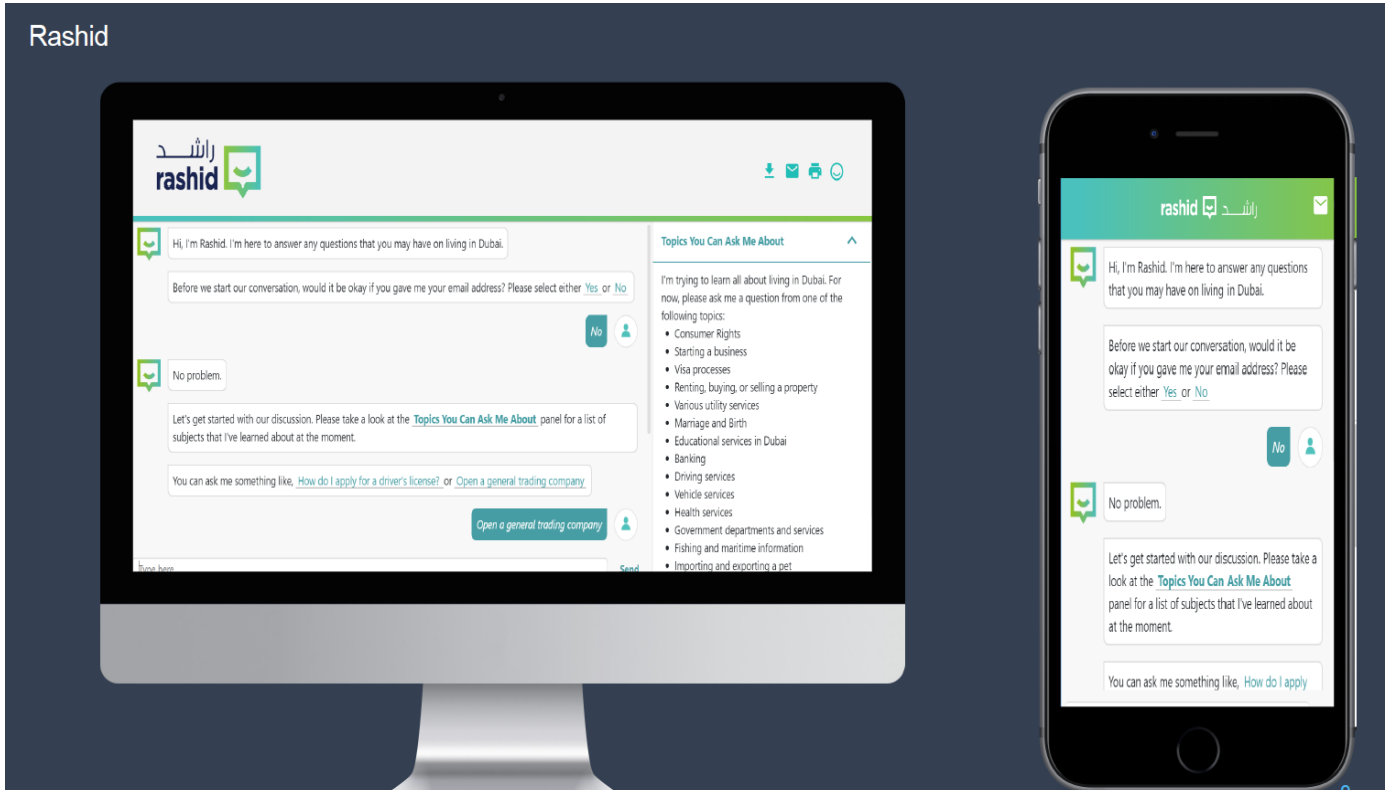
CITY SCIENCE ENTREPRENEURSHIP & START-UP SUPPORT

COLLABORATION FOR URBAN SOLUTIONS (PPPs, CROSS-CITY, etc.)

CITY SCIENCE FINANCIAL INCENTIVES

City Science Application Framework

Smart Dubai – city concierge



City Science Application Framework

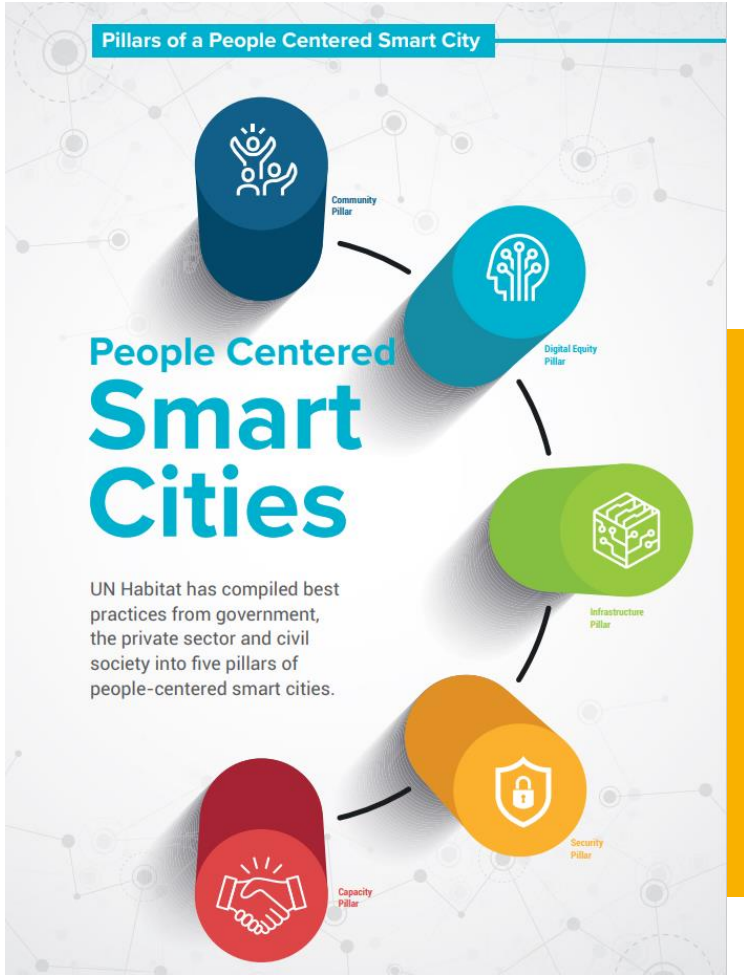
Queensland hyperdome – energy savings

Stuttgart – fine dust filtration

Tool #3:

People-centered smart cities framework

People-Centered Smart Cities Framework



A people-centered approach to smart cities is needed to ensure that:

- We use technology to advance human development and show commitment to human rights, both in online and offline environments,
- Be aware of the growing digital divide and put in place mechanisms for digital inclusion to ensure everyone benefits from the digital revolution, and
- We use digital technologies to address urban challenges, such as housing and delivery of urban basic services, and as a result strive to improve people's quality of life in cities.
- Technology doesn't replace citizen engagement in community and city affairs.

People-Centered Smart Cities Framework

Pillars of people-centered smart cities

Source: centering_people_in_smart_cities.pdf (unhabitat.org)

Tool #4

Creating Smart City Strategies

Steps to Building a People-Centered Smart City Strategy

1. Identify a leadership structure:

Obtain leadership support and buy-in for digital transformation. Establish key roles such as a Chief Technology Officer or Chief Digital Officer, that are endowed with leadership capability needed for successful digital transformation at the organizational level. You can align your efforts with an independent certification process, an executive order, or through the mayor, city manager or city council members depending on your form of government.

2. Build your capacity and position the plan:

Determine what financial, staffing, or infrastructural resources are required to be successful. Identify opportunities for existing staff to build the necessary digital literacy or technology skills. Show how your strategy is connected to other key local plans (such as economic development, education, community development plans) and relevant national policies and initiatives.

3. Create a standard for inclusive participation:

Establish standards for public participation processes that are transparent, inclusive, respect privacy, and demonstrate the results of participating.

4. Identify key partners:

Identify what national and local organizations can support your strategy including community organizations, local advocacy groups, potential P3 opportunities, NGOs, regional or national government programs and offices. Also be sure to look at who isn't around the table and who might need to be.

5. Build a digital equity framework:

Everyone cannot fully participate in, or benefit from digital transformation without having equitable access to ICTs. Early in your strategy, work towards establishing a digital inclusion plan for inclusive access to connectivity, digital skills and devices.

Steps to Building a People-Centered Smart City Strategy

6. Build a management and operations ecosystem:

Establish how your people-centered programmes will be managed and supported through digital infrastructure. This includes identifying finance strategies, building Information technology systems including data platforms and cybersecurity architecture, identifying supportive legal frameworks at the regional and national level and identifying opportunities to operationalise human rights through municipal code, ordinances, policies and procurement.

7. Create a plan for data:

Data is a critical asset in a people-centered smart city, that should be owned and accessible by the public. Establish an IT plan for data, complemented by an interoperable smart city platform, in addition to a Data Governance Policy, Open Data Policy, Privacy Policy or a Digital Bill of Rights.

8. Build programme design and implementation:

Begin to identify key programme offerings, pilot projects and other initiatives that will be supported by all the items identified in steps 1-7. These offerings should directly address needs expressed by communities as identified through public participatory processes.

9. Create an evaluation framework:

Decide how you will measure success using Key Performance Indicators (KPIs) and create a strategy for collecting data about your progress. If using surveys, be sure to include a representative sample of the population, use inclusive survey language, and take steps to address the digital divide by surveying people in person.

10. Pilot and pivot:

Test your smart city technologies in the wild. Begin with deployments or programming at a small scale or with focus groups, identify lessons learned and refine your approach before scaling. If the approach was not successful, identify the reasons why and make the necessary pivot.

Tool #5

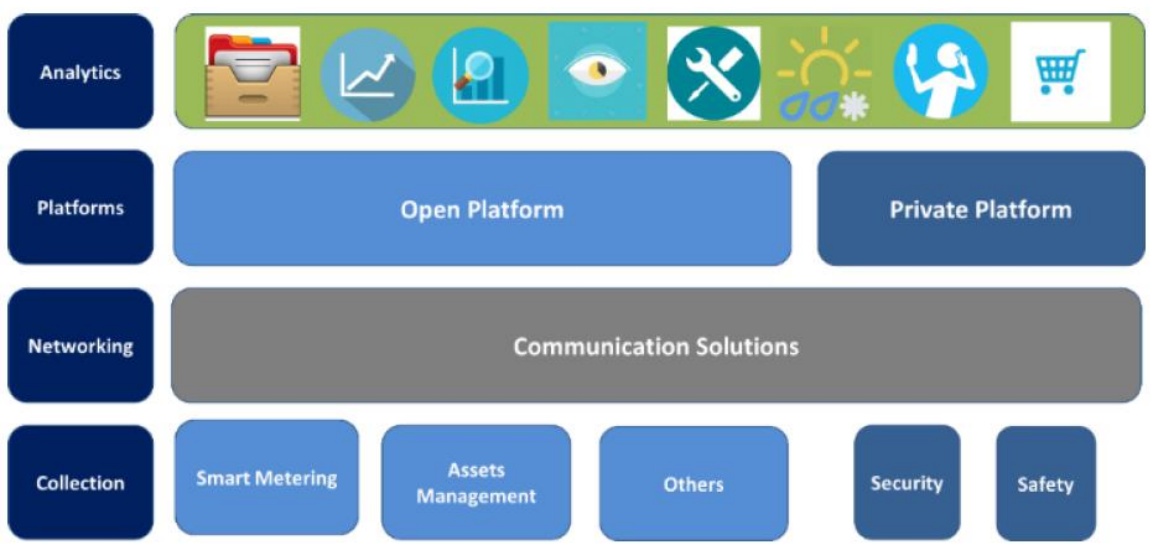
Creating Smart Societies

A Holistic Approach to Creating Smart Societies

9 key principles to create smart societies

- top-bottom/bottom-up design
- enabling infrastructure
- sharing
- innovation
- intelligent governance
- smart lifestyle
- standardization
- community participation
- effective business models (sustainability)

Information layered architecture in smart cities



ITU-D Question 1/2 – Annual deliverable 2018-2019: A holistic approach to creating smart societies

Module 11 –
Smart Sustainable Governance

Thank you for completing this Module of the ITU Toolkit on Digital Transformation for People-Oriented Cities and Communities.

We hope that you found the information in this Module useful toward planning and initiating your city or community's digital transformation process.

Please review the resources highlighted within for further details, including valuable real-world use cases, on how to get started on – and optimize from the onset – your city or community's digital transformation journey.

Toolkit on Digital Transformation for People-Oriented Cities and Communities

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