

ITU-T Study Group 20

**Internet of Things, digital twins
and smart sustainable cities
and communities**

2025



International Telecommunication Union

Promoting global collaboration for a connected world



The [International Telecommunication Union \(ITU\)](#) is the United Nations specialized agency for information and communication technologies (ICTs)



194

Member States



+1000

Companies, universities,
research institutes and
international organisations



Leadership through governance

Resolution 197 – Facilitating the Internet of things for smart sustainable cities and communities



Resolution 200 – Connect 2030 Agenda for global telecommunication/information and communication technology, including broadband, for sustainable development

Resolution 98 - Enhancing standardization of Internet of Things, digital twins, and smart sustainable cities and communities for global development



Resolution 78 - Information and communication technology applications and standards for improved access to e-health services

Resolution 105 - Promoting and strengthening metaverse standardization

Resolution 106 - Enhancing standardization activities on sustainable digital transformation



Powering progress: ITU-T's role in driving digital transformation globally



Digital transformation is unlocking potential in various sectors



Transportation



Agriculture



Healthcare



Energy



Public
Administration



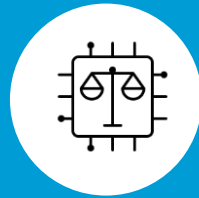
Manufacturing



With opportunity, comes challenges with digital transformation



Data Privacy



Ethical and Accessibility



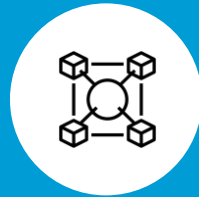
Regulatory Hurdles



Public Acceptance & Trust



Infrastructure & resources



Interoperability & Standards



While digital transformation presents challenges, international standards are key to overcoming them and enabling successful scaling.



How international standards set the building blocks for digital transformation?



How SG20 supports IoT, digital twins and smart sustainable cities and communities

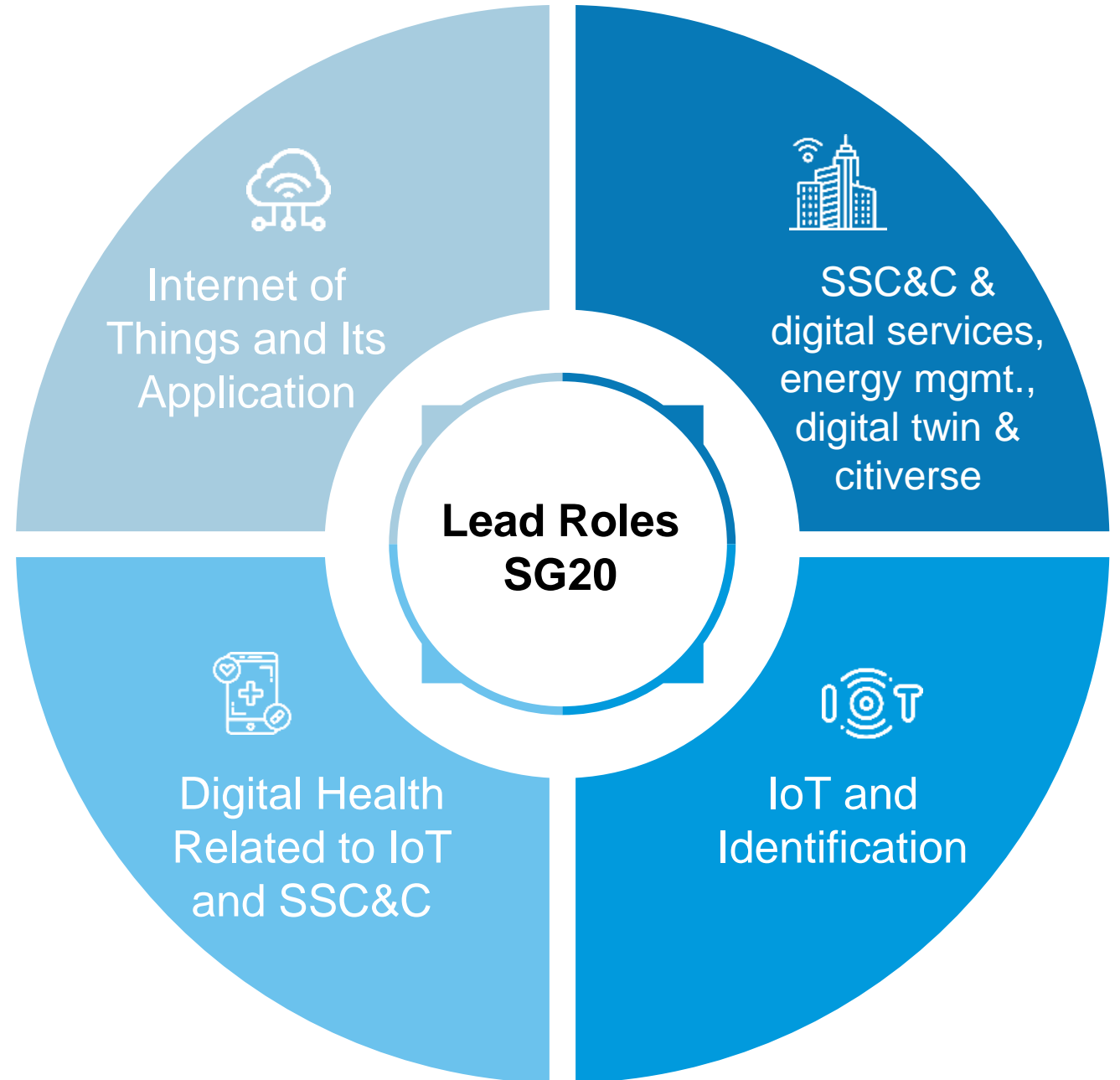


ITU-T Study Group 20 (SG20) is responsible for:

the development of innovative standards (called “ITU-T Recommendations”), guidelines, reports, methodologies, and best practices for the Internet of Things (IoT), digital twins, and smart sustainable cities and communities (SSC&C), with the goal of accelerating digital transformation.



SG20 on IoT, digital twins and smart sustainable cities and communities



ITU-T SG20 - Management Team

Chair



☐ **Hyoung Jun Kim**
• Korea (Rep. of)

Vice Chairs



☐ **Ali Abbassene**
• Algeria

☐ **Muath AlRumayh**
• Communications, Space & Technology Commission (CST)

☐ **Ramy Ahmed Fathy**
• Egypt

☐ **Imen Gueich**
• Tunisia

☐ **Christina Nsofwa Lesa-Chibesakunda**
• Zambia

☐ **Song Luo**
• China

☐ **Sophia Nahoza**
• Tanzania

Counsellor



☐ **Cristina Bueti**
• ITU

Administrative Assistant



☐ **Chiara Co**
• ITU



SG20 - Study Group Structure (Study Period 2025-2028)



1/20

Interworking between smart city platforms including digital twins



2/20

Requirements, capabilities and architectural frameworks of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C) across verticals



3/20

Architectures, functionalities and protocols in applications of verticals and infrastructures of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)



4/20

Data analytics, sharing, processing and management, including big data aspects, of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)



5/20

Terminology and definitions, study and research of emerging digital technologies



6/20

Security, privacy, trustworthiness, and identification of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)



7/20

Evaluation and assessment of smart sustainable cities and communities and digital services



8/20

Human-centric digital services enabled by Internet of Things (IoT) and smart sustainable cities and communities (SSC&C) related to digital health, accessibility and inclusion



9/20

Decentralized/ distributed Internet of Things (IoT)

ITU-T SG20 Key topics and standards



Recommendation ITU-T Y.4219
"Accessibility requirements for user interface of smart applications supporting IoT"

Recommendation ITU-T Y.4487
"A functional architecture of roadside multi-sensor data fusion systems for autonomous vehicles"

Recommendation ITU-T Y.4505
"Minimal interoperability mechanisms for smart and sustainable cities and communities"

Recommendation ITU-T Y.4498
"Framework of city-level energy data sharing and analytics among buildings"

Recommendation ITU-T Y.4906:
"Assessment framework for digital transformation of sectors in smart cities"

Recommendation ITU-T Y.4052
"Vocabulary for blockchain for supporting Internet of things and smart cities and communities in data processing and management aspects"

Recommendation ITU-T Y.4225
"Requirements and capability framework of digital twin for intelligent transport system"

Recommendation ITU-T Y.4494
"Reference architecture of collaborative decentralized machine learning for intelligent IoT services"

Recommendation ITU-T Y.4605
"Information exchange model for digital twin federation in smart cities and communities"

Recommendation ITU-T Y.4504
"Service framework of prediction for intelligent IoT"

Recommendation ITU-T Y.4909
"Assessment framework of IoT sensing quality"

Recommendation ITU-T Y.4500.3
"oneM2M - Security solutions"

Recommendation ITU-T Y.4228
"Requirements and framework of Industrial IoT (IIoT) infrastructure for smart manufacturing"

Recommendation ITU-T Y.4703
"Internet of things service management application programming interface Representational State Transfer specification"

Recommendation ITU-T Y.4607
"Requirements for the interworking of autonomous urban delivery robots"

Recommendation ITU-T Y.4560
"Blockchain-based data exchange and sharing for supporting Internet of things and smart cities and communities"

Recommendation ITU-T Y.4910
"Maturity model of digital supply chain for smart sustainable cities"

Recommendation ITU-T Y.4809:
"Unified IoT Identifiers for intelligent transport systems"



ITU-T SG20 - Regional Groups



ITU-T SG20 Regional Group for Latin America (SG20RG-LATAM)

SG20RG-LATAM - Management Team



SG20RG-LATAM Chair:

Juan Pablo Martín
(Universidad Tecnológica Nacional,
Argentina)

SG20RG-LATAM Vice-chairs:

Amparo Arango (INDOTEL)

Héctor Budé (URSEC, Uruguay)



ITU-T SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia (SG20RG-EECAT)

SG20RG-EECAT - Management Team



SG20RG-EECAT Chair:

Alexey Borodin (Russian Federation)

SG20RG-EECAT Vice-chair:

Umida Musaeva (Uzbekistan)



ITU-T SG20 Regional Group for the Arab Region (SG20RG-ARB)

SG20RG-ARB - Management Team



SG20RG-ARB Chair:

Muath AlRumayh
(Communications, Space & Technology
Commission (CST))

SG20RG-ARB Vice-chairs:

Ali Abbassene
(Algeria)

Abdulhadi Aboualmal (United Arab Emirates)

Rana Alsaqabi (CITRA)

Bilel Chabou (Ministère Des Technologies De La
Communication Et De L'économie Numérique)

Ramy Ahmed Fathy
(Egypt)



ITU-T SG20 Regional Group for Africa (SG20RG-AFR)

SG20RG-AFR - Management Team



SG20RG-AFR Chair:

Ramy Ahmed Fathy (Egypt)

SG20RG-AFR Vice-chairs:

Ali Abbassene (Algeria)

El Hadj Sekou Ascofare (Autorité Malienne de Régulation des Télécommunications, des Technologies de l'Information et de la Communication et des Postes (AMRTP))

Bilel Chabou (Ministère Des Technologies de la Communication et de L'économie Numérique)

Mwesigwa Elton Felician (Tanzania Communications Regulatory Authority (TCRA))

Mel Paule Renee Lasme (ARTCI)

Achime Malick Ndiaye
(Ministère des Postes et des Télécommunications)



ITU-T SG20 Regional Group for Asia and the Pacific (SG20RG-AP)

SG20RG-AP - Management Team



SG20RG-AP Chair:

Sushil Kumar (Ministry of Communications, India)

SG20RG-AP Vice-chairs:

Chao Ma (Ministry of Industry and Information Technology (MIIT), China)

Shamsuzzoha (The Bangladesh Telecommunication Regulatory Commission (BTRC))



Joint Coordination Activity on Internet of Things and Smart Cities and Communities (JCA-IoT and SC&C)



**Coordinating ITU-T
work on IoT and
SC&C**



**Providing contact point
for IoT & applications,
including SC&C
activities**



**JCA-IoT and SC&C
roadmap**



Collaboration is key to drive innovation



Joint IEC-ISO-ITU Smart Cities Task Force (J-SCTF)

ITU, ISO and IEC have established a Joint Smart Cities Task Force to coordinate international standardization for smart cities.



Collaboration with industry & fora

LoRa Alliance



ITU-T documents

Formal meeting documents ([SG home page](#))



Collective letters – meeting announcements



Circulars – other info to all membership (e.g. on events)



Resolutions (revised every 4 years in WTSA)



Contributions – written proposals submitted by members (sequential numbering inside a study period) – submit Contributions at least 12 calendar days before the meeting in question if no translation required.

ITU-T is a contribution-driven (and consensus-based) organization

ITU-T documents cont.

Formal meeting documents ([SG home page](#))



TDs – produced by SG leadership team and TSB (sequential in a study period, multiple TD series possible)



Liaison statements – communications with liaison partners



Reports – reports created at meetings, draft texts

Working documents (informal FTP area, collaboration site)



Rapporteur group meetings documents - some docs have no life outside the meeting (e.g. drafting docs), others are submitted as TD to next SG/WP meeting

Mailing lists

General distribution list for SG20

- t25sg20all@lists.itu.int

Q1/20: *Interworking between smart city platforms including digital twins*

- t25sg20q1@lists.itu.int

Q2/20: *Requirements, capabilities and architectural frameworks of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C) across verticals*

- t25sg20q2@lists.itu.int

Q3/20: *Architectures, functionalities and protocols in applications of verticals and infrastructures of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)*

- t25sg20q3@lists.itu.int

Q4/20: *Data analytics, sharing, processing and management, including big data aspects, of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)*

- t25sg20q4@lists.itu.int

Q5/20: *Terminology and definitions, study and research of emerging digital technologies*

- t25sg20q5@lists.itu.int

Q6/20: *Security, privacy, trustworthiness, and identification of Internet of Things (IoT) and smart sustainable cities and communities (SSC&C)*

- t25sg20q6@lists.itu.int

Q7/20: *Evaluation and assessment of smart sustainable cities and communities and digital services*

- t25sg20q7@lists.itu.int

Q8/20: *Human-centric digital services enabled by Internet of Things (IoT) and smart sustainable cities and communities (SSC&C) related to digital health, accessibility and inclusion*

- t25sg20q8@lists.itu.int

Q9/20: *Decentralized/distributed Internet of Things (IoT)*

- t25sg20q9@lists.itu.int

AHG on IoT, digital twins and AI for effective energy management (AHG-EEM)

- t25sg20ahgeem@lists.itu.int

ITU-T SG20 Regional Group for Asia and the Pacific (SG20RG-AP)

- tsg20rgap@lists.itu.int

ITU-T SG20 Regional group for the Arab Region

- tsg20rgarb@lists.itu.int

ITU-T SG20 Regional group for the African

- tsg20rgafr@lists.itu.int

ITU-T SG20 Regional group for Latin American

- tsg20rglatam@lists.itu.int

ITU-T SG20 Regional group for Eastern Europe, Central Asia and Transcaucasia

- tsg20rgeecat@lists.itu.int

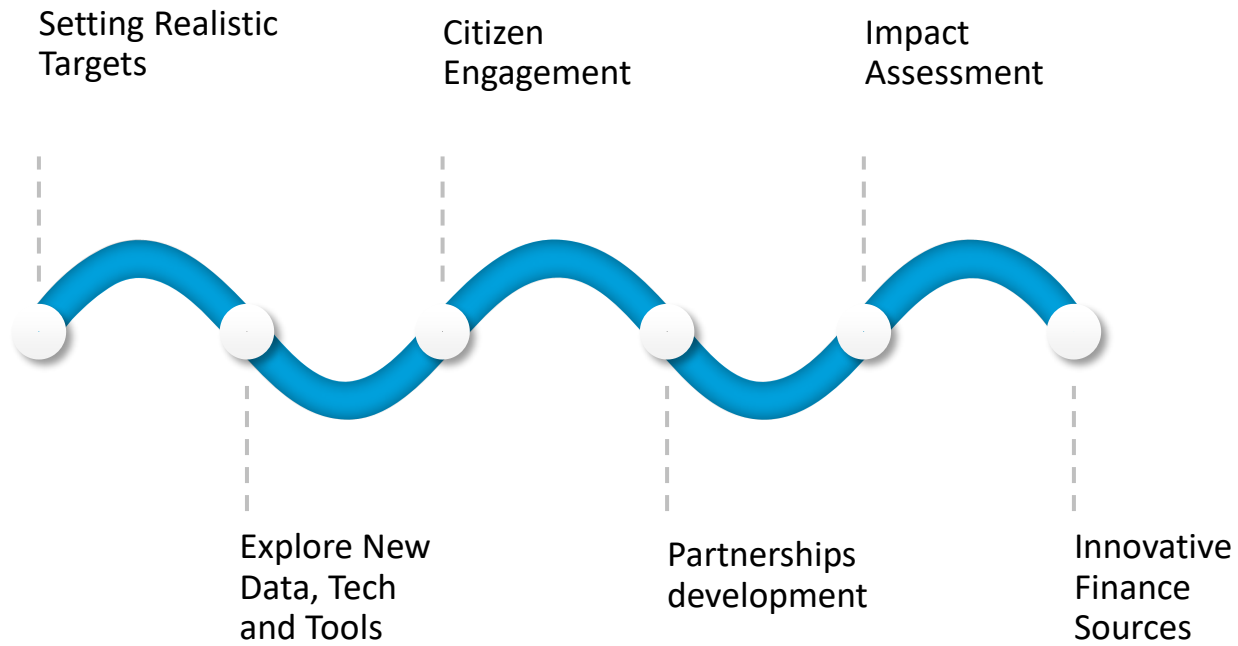


Policy Guidance

Policies shape the foundation of sustainable urban development



Policy guidance on sustainable digital transformation for city leaders



Creating people-centred smart cities

The United for Smart Sustainable Cities serves as the global platform to advocate for public policy and to encourage the use of digital technologies to facilitate the sustainable digital transformation of cities.



Working collaboratively through our ongoing Thematic Groups

The U4SSC thematic groups develop action plans, technical specifications, case studies, guidelines and offer policy guidance for cities to become smarter and more sustainable while accelerating their digital transformation.



City Platforms



Building Urban Economic Resilience
at City Level



Artificial Intelligence in Cities



Enabling People-Centred Cities
through Digital Transformation



Digital Wellbeing

New



Future Foresight for Cities



Sustainable Digital
Transformation in Buildings
and Energy



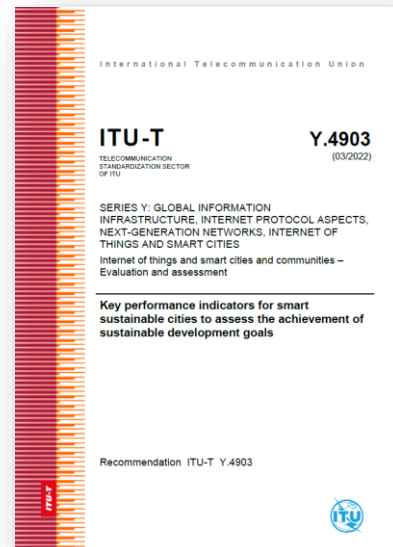
Social-cultural Sustainability
in People-centred City
Governance



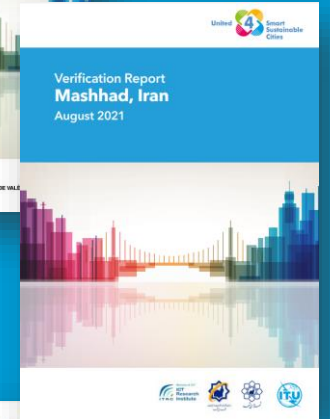
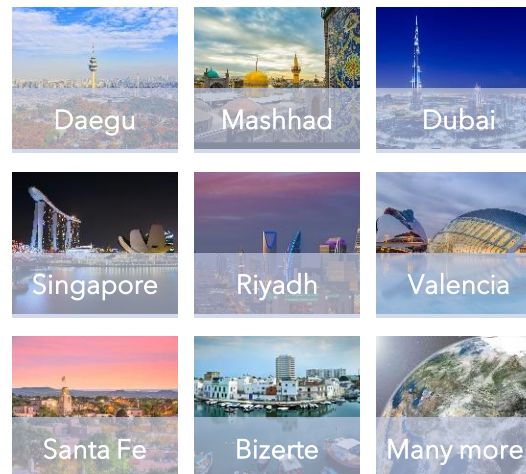
Digital Public Infrastructure
for Cities

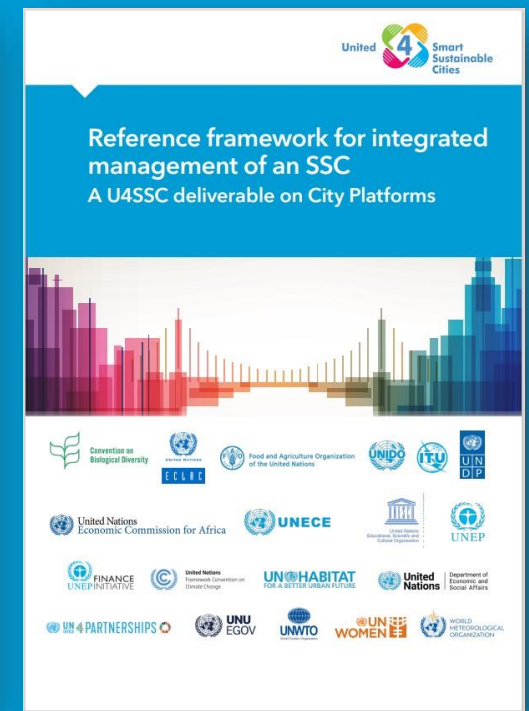
Measuring progress and driving innovation

The U4SSC Key Performance Indicators for Smart Sustainable Cities, based on ITU-T Recommendation Y.4903, have been developed to provide cities with a consistent and standardised method to collect data and measure performance and progress.



Over 200 cities have implemented the U4SSC KPIs







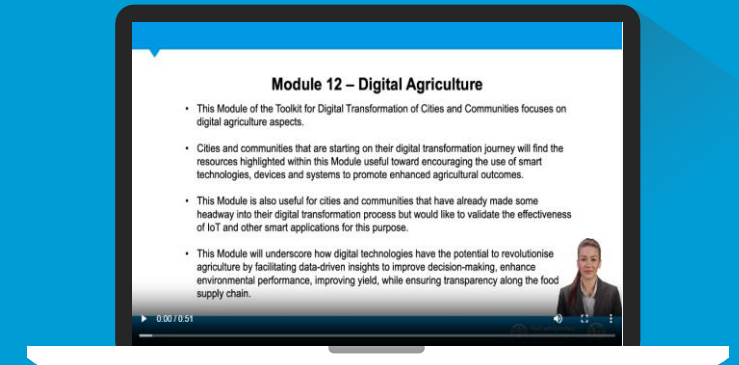
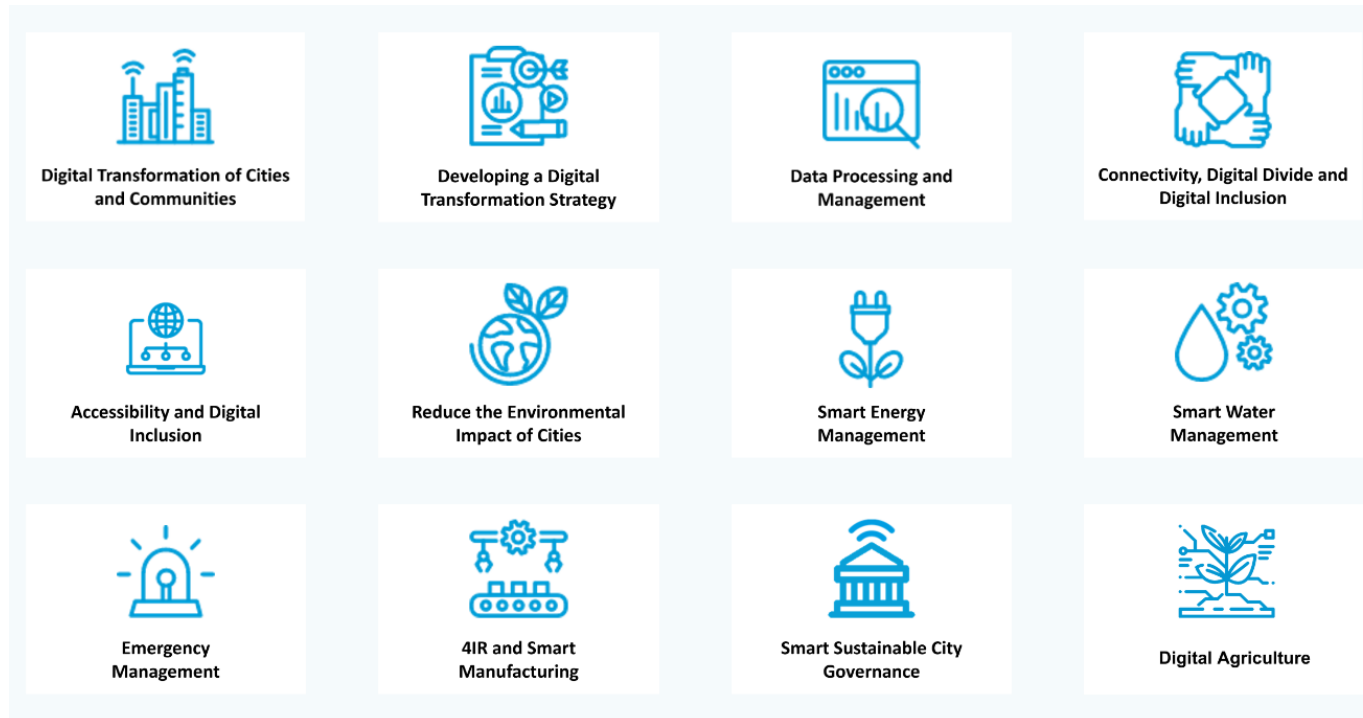
Capacity Building

By providing cities with training and tools they need, they can be equipped to tackle the challenges of tomorrow.



One-stop guide for cities and communities

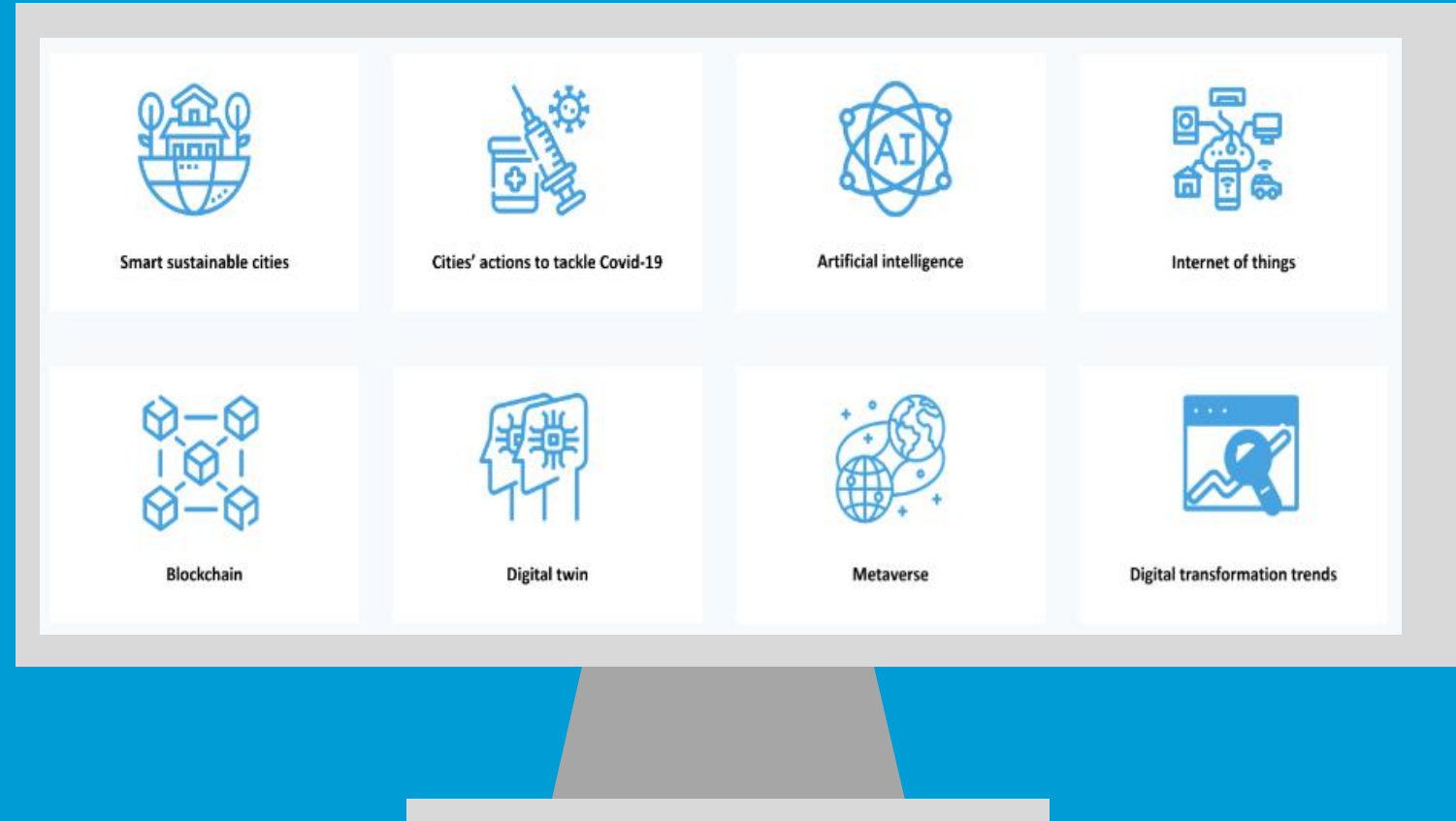
Toolkit on Digital Transformation for Cities and Communities



UN Cross sector collaboration

Knowledge. Innovation. Action.

Digital Transformation Resources Hub





Raising Awareness

**Raising awareness
today, to shape a
smarter future
tomorrow**



Conversations that matter

Digital Transformation Dialogues



Webinars

Fireside Chats

Ask the Expert

The Digital Transformation Dialogues disseminate knowledge and expand our understanding about the rapidly evolving landscape of emerging technologies and technical standardization across different fields.

- Quantum Computing
- Machine Learning
- Artificial Intelligence
- Metaverse
- Blockchain & DLT
- Circularity
- Accessibility
- Counterfeiting
- Smart cities
- Digital twins
- Digital public infrastructure
- Virtual worlds
- Immersive inclusivity
- and more...



Webinars



Fireside Chats



Ask the Expert

Relevant links

ITU-T Activities on Digital Transformation for People-Centred Cities

- <https://www.itu.int/cities/>

ITU-T Study Group 20: Internet of Things, digital twins and smart sustainable cities and communities

- <https://www.itu.int/go/tsg20>

ITU-T SG20 Regional Group for the Africa Region

- <http://itu.int/go/tsg20rgafr>

ITU-T SG20 Regional Group for the Arab Region

- <http://itu.int/go/tsg20rgarb>

ITU-T SG20 Regional Group for the Latin America Region

- <http://itu.int/go/tsg20rglatam>

ITU-T SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia

- <http://itu.int/go/tsg20rgeecat>

ITU-T SG20 Regional Group for Asia and the Pacific

- <http://itu.int/go/tsg20rgap>

Joint Coordination Activity on Internet of Things and Smart Cities and Communities (JCA-IoT and SC&C)

- <https://www.itu.int/en/ITU-T/jca/iot/Pages/default.aspx>

United for Smart Sustainable Cities (U4SSC)

- <https://u4ssc.itu.int/>



Thank you!



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Website

www.itu.int/cities