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| Title: ITU logo | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2022-2024 | | | | TSAG-TD207 |
| TSAG |
| **Original: English** |
| **Question(s):** | | N/A | | | Geneva, 30 May - 2 June 2023 |
| **TD (Ref.:** [SG20-LS70](http://handle.itu.int/11.1002/ls/sp17-sg20-oLS-00070.docx)**)** | | | | | |
| **Source:** | | ITU-T Study Group 20 | | | |
| **Title:** | | LS/i on ITU-T SG20 Lead Study Group Report [from ITU-T SG20] | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | | - | | |
| **For information to:** | | | TSAG | | |
| **Approval:** | | | ITU-T Study Group 20 Management Team (8 May 2023 by correspondence) | | |
| **Deadline:** | | | N/A | | |
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| **Contact:** | | | Ziqin Sang WP2/20 Co-chairman | Tel:  +86 27 67840289 Fax:  +86 27 8769 4034 E-mail:  [zqsang@ycig.com](mailto:zqsang@ycig.com) | |
| **Contact:** | | | Harinderpal Singh Grewal WP2/20 Co-chairman | Tel: +65 9795 0698  E-mail: [harin@yahoo.com](mailto:harin@yahoo.com) | |

A new liaison statement has been received from SG20.

This liaison statement follows and the original file can be downloaded from the ITU ftp server at <http://handle.itu.int/11.1002/ls/sp17-sg20-oLS-00070.docx>.

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| A black and white logo  Description automatically generated with low confidence | INTERNATIONAL TELECOMMUNICATION UNION  **TELECOMMUNICATION STANDARDIZATION SECTOR**  STUDY PERIOD 2022-2024 | | | | **SG20-LS70** |
| **STUDY GROUP 20** |
| **Original: English** |
| **Question(s):** | | All/20 | | |  |
| **LIAISON STATEMENT** | | | | | |
| **Source:** | | ITU-T Study Group 20 | | | |
| **Title:** | | LS on ITU-T SG20 Lead Study Group Report | | | |
| **LIAISON STATEMENT** | | | | | |
| **For action to:** | | | - | | |
| **For comment to:** | | | - | | |
| **For information to:** | | | TSAG | | |
| **Approval:** | | | ITU-T Study Group 20 Management Team (8 May 2023 by correspondence) | | |
| **Deadline:** | | | N/A | | |
| **Contact:** | | | Hyoung Jun Kim Chairman ITU-T SG20 | Tel:  +82 428606576 Fax:  +82 428615404 E-mail:  [khj@etri.re.kr](mailto:khj@etri.re.kr) | |
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| **Contact:** | | | Ziqin Sang WP2/20 Co-chairman | Tel:  +86 27 67840289 Fax:  +86 27 8769 4034 E-mail:  [zqsang@ycig.com](mailto:zqsang@ycig.com) | |
| **Contact:** | | | Harinderpal Singh Grewal WP2/20 Co-chairman | Tel: +65 9795 0698  E-mail: [harin@yahoo.com](mailto:harin@yahoo.com) | |

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| **Abstract:** | This report contains the report of the ITU-T SG20 on lead study group activities (November 2022 – May 2023). |

ITU-T Study Group 20 is actively fulfilling its mandate as the lead study group on: Internet of Things (IoT) and its applications; smart cities and communities, and related digital services; for Internet of Things identification; and digital health related to Internet of Things and smart cities and communities.

For additional information on ITU-T SG20, please see <https://www.itu.int/en/ITU-T/studygroups/2022-2024/20/Pages/mandate.aspx>

# 1 ITU-T SG20 as:

# Lead study group on Internet of Things and its applications

Lead study group on smart cities and communities, and related digital services

Lead study group for Internet of Things identification​

Lead study group on digital health related to Internet of Things, and smart cities and communities​

# Achievements

The list of results pertaining to the ITU-T SGs Recommendations on Internet of Things (IoT), and its applications since November 2022, are provided in Annex 1 (status: 8 May 2023).

# Plan of work for this study period

Draft Recommendations and other texts on Internet of Things (IoT) and Smart Cities and Communities (SC&C) currently under development in ITU-T SG20 are listed in Annex 2.

# Working Party 1/20

# Main achievements

During the last SG20 meeting, WP1/20 approved 11 New Work Items and 17 outgoing Liaison Statements were prepared within WP1/20.

# Ongoing work in Working Party 1/20

# Question 1/20 – Interoperability and interworking of IoT and SC&C applications and services

Q1/20 addresses use cases, requirements, architectures and data sets and format to support interworking and provide interoperability between IoT and SC&C applications and services not only within but also between cities and communities. ​These studies include, but are not limited to: the use cases for interworking between IoT and SC&C applications and services; requirements and architectures to support interworking and provide interoperability of IoT and SC&C applications and services; and data interoperability and semantic interoperability.

Q1/20 is currently working on eight work items, as detailed in Annex 2.

# Question 2/20 - Requirements, capabilities and architectural frameworks across verticals enhanced by emerging digital technologies

Question 2/20 is responsible for developing Recommendations that address the common and specific requirements, capabilities and architectural frameworks enhanced by emerging technologies across verticals. On the basis of use cases and related ecosystem aspects, the requirements, capabilities and architectural frameworks enhanced by emerging technologies for the support of IoT and SC&C services and applications will be specified from the common (not vertical-dependent) and vertical specific viewpoints.

Question 2/20 is currently working on 25 work items, as detailed in Annex 2.

# Question 3/20 - IoT and SC&C architectures, protocols and QoS/QoE

Question 3/20 is responsible for developing Recommendations that address architectures, including their functionalities, interfaces, protocols, data models, intelligent management mechanisms, control mechanisms, connectivity technologies, APIs, and Quality of Experience/Service (QoE/QoS) of IoT and Smart Sustainable Cities and Communities (SSC&C), which needed to construct architectural frameworks to interact with services and applications, as well as different networks and systems. Question 3/20 is also responsible for developing Recommendations on other aspects based on this architecture, including, but not limited to, protocols, APIs, identification and management mechanisms.

Question 3/20 is currently working on 24 work items, as detailed in Annex 2.

# Question 4/20 - Data analytics, sharing, processing and management, including big data aspects, of IoT and SC&C

Question 4/20 is responsible for developing Recommendations on DPM, data analytics and sharing, including big data aspects for IoT and SC&C.

Question 4/20 is also responsible for developing Recommendations on trusted data and data quality in DPM frameworks, including: digital identification and certification; analysis of existing technologies, platforms, guidelines and standards for DPM; and architectural frameworks for the future of data driven ecosystems and their applications with DPM and big data.

Question 4/20 is currently working on 16 work items, as detailed in Annex 2.

# Working Party 2/20

# Main achievements

During the last SG20 meeting, WP2/20 has also approved three New Work Items and six outgoing Liaison Statements were prepared.

# 3.2 Ongoing work in Working Party 2/20

# Question 5/20 - Study of emerging digital technologies, terminology and definitions

Question 5/20 is tasked with capturing and developing definitions, and contributing to a common terminology for IoT and SC&C. This Question can also contribute to research solutions for interoperability across different technologies, taking into account end-user, regulatory and market needs. Considering the rapid evolution of the IoT domain, this Question can also contribute to the identification and discussion of relevant research and technological developments in this area, in order to bring the most relevant topics to the attention of ITU-T Study Group 20 (SG20) and/or to the corresponding Questions.

Question 5/20 is currently working on four work items, as detailed in Annex 2.

# Question 6/20 - Security, privacy, trust and identification for IoT and SC&C

Question 6/20 is developing Recommendations, Supplements, Guidelines and Technical Reports on topics such as: authenticity, confidentiality, integrity, non‑repudiation and availability of IoT devices, systems, applications, protocols, platforms, and services; security and trust provisioning in IoT at the ICT infrastructure and future heterogeneous converged-service environments; security and trust provisioning in IoT services and applications for converged environments among stakeholders of different industries; requirements to mitigate the risks and threats identified in IoT and SC&C systems and services; utilizing security constructs in IoT systems to protect identity, privacy, and security of the system; technical measures to prevent compromise, and protect the integrity and privacy of IoT systems, applications, platforms, and services; technical measures needed to support the protection of privacy in SC&C applications, services, and platforms; identifying the potential risks associated with the different management, administration, maintenance, and service provisioning in SC&C; how to mitigate risks associated with the different management, administration, maintenance, and service provisioning in SC&C; supporting availability and portability of the data in IoT and SC&C platforms, systems, and services; the use of naming, addressing, and identification in IoT and SC&C deployments; and identity discovery and identity management in IoT and SC&C.

Question 6/20 is currently working on four work items, as detailed in Annex 2.

1. **Question 7/20 - Evaluation and assessment of Smart Sustainable Cities and Communities**

Question 7/20 is developing Recommendations, Supplements and Technical Reports on topics such as: methodologies for assessment of city SDGs, considering general principles, criteria for evaluating ICT impact; collecting and calculating reliable data to feed into the assessment model; developing methodologies for measuring and evaluating a city's specific performance and e/smart services with respect to defined sector indicators; and reporting a city's performance to help cities to reach SDGs.

Question 7/20 is currently working on 11 work items, as detailed in Annex 2.

# Collaboration with other SGs and external organizations

ITU-T SG20 received and responded to many Liaison Statements including those from: TSAG, ITU-T SG2, ITU-T SG3, ITU-T SG5, ITU-T SG9, ITU-T SG11, ITU-T SG12, ITU-T SG13, ITU-T SG15, ITU-T SG16, ITU-T SG17, ITU-D, FG-DPM, FG-DLT, FG-VM, Standardization Committee for Vocabulary (SCV), JCA-IMT2020, JCA-AHF, CITS, ITU-R, ITU-D, IEC SyC Smart Cities, ISO/IEC JTC1, ISO TC 204, ISO TC 184, IEC TC 65, Internet Engineering Task Force (IETF), OMA, ETSI ISG CDP, ISCG, ICAO, LoRa Alliance, IEEE, TM Forum, W3C and oneM2M, among others.

In addition, JCA-IoT/SC&C seeks coordination with other SDOs and other forums.

## 4.1 Collaboration with TM Forum

In the last study period, according to [TD1755](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1755) - LS/i on Technical specifications on TMF 908 IoT agent and device management API specification and IoT service management API specification from TM Forum, TM Forum invited ITU-T SG20 to consider transposing the following Technical Specifications on TMF 908 IoT Agent and Device Management API Specification and IoT Service Management API Specification into ITU-T Recommendations using Recommendation ITU-T A.25.

During the ITU-T SG20 plenary (July 2020), two new work items were approved, which were contained respectively in [TD1783-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1783) and [TD1782-R3](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG20-200706-TD-GEN-1782) . 

* ITU-T Y.TM.DM-API “IoT Device Management API REST Specification”.
* ITU-T Y.TM.SM-API “IoT Service Management API REST Specification”.

​Working Party 1 of ITU-T SG20 reviewed the two Technical Specifications during the Q3/20 Rapporteur Group Meeting held virtually on 2–5 November 2020, and during the Working Party 1/20 meeting that took place on 6 November 2020. The meeting received a list of comments and questions. Accordingly, Working Party 1 of ITU-T SG20 sent out an LS to TMForum, which included the comments and questions received from the meeting, as contained in [TD1961](https://www.itu.int/md/T17-SG20-201106-TD-GEN-1961/en).

During the ITU-T SG20 plenary that took place on 18–28 July 2022, in Geneva, Switzerland, the editors proposed a revised baseline text to add editorial improvements on draft new Recommendation ITU-T Y.TM.DM-API *“IoT Device Management API REST Specification”* and draft new Recommendation ITU-T Y.TM.SM-API “*IoT Service Management API REST Specification”.* The proposed baseline texts have been reviewed and agreed, as contained [TD218](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0218) and [TD219](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0219).

During the ITU-T SG20 plenary (January 2023) in Geneva, Switzerland, it was agreed to submit the two work items (ITU-T Y.TM.SM-API and ITU-T TM.DM-API) for consent. However, issues were raised concerning IPR matters and consequently, while these two documents had been considered mature for consent from a technical perspective, it was agreed to postpone its consent until further clarification is provided on the IPR matters. The output documents of these two draft Recommendations are: [TD565-R2](https://www.itu.int/md/T22-SG20-230130-TD-GEN-0565/en) and [TD564-R2](https://www.itu.int/md/T22-SG20-230130-TD-GEN-0564/en).

## 4.2 Collaboration with oneM2M

ITU has excellent cooperation with oneM2M and is exploring the possibility of furthering its synergies with oneM2M. ​

During the ITU-T SG20 meeting, the following document has been considered:

* [TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) - Follow-up on TSDSI’s policy documents for ITU-T A.5 qualification

[TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) was presented by TSB at the SG20 Opening Plenary.

At the SG20 closing plenary held in July 2022, SG20 approved the A.5 qualification for TSDSI, and by extension, SG20 also approved the A.5 qualification for oneM2M by applying section 7.3 of ITU-T A.5, as all oneM2M partners became A.5 qualified.

As of this decision of qualification, two TSDSI’s policy documents (the TSDSI Software Copyright Policy and the TSDSI Trademark Usage Guidelines) were still to be approved by TSDSI. A request was made to review the status of those documents at the meeting of WP2/TSAG in December 2022 ([TSAG-TD011R1](https://www.itu.int/md/T22-TSAG-221212-TD-GEN-0011/en)), and this request was deferred to SG20 for a follow up.

[TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) confirms that those documents were approved by TSDSI in August 2022, and can be considered as being consistent with ITU’s relevant guidelines.

SG20 noted [TD551](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0551) and continues to collaborate with TSDSI and oneM2M as A5 qualified organizations.

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

The 7th J-SCTF meeting took place physically in Seoul, Republic of Korea, with remote participation from 28–30 November 2022, and was chaired by ITU Co-chairman, Dr Hyoung Jun Kim (Chairman, ITU-T SG20)

Agreed Task & Finish (T&F) group action items:

***T&F group 2: Mapping exercise on the existing SDOs work in smart and sustainable cities***

* To produce a consolidated document that contains the result of the mapping exercise

***T&F group 3: SDGs and link with smart cities activities***

* To undertake detailed discussions to generate a consensus-based master list of City aspects, and mapping them to the relevant SDGs and their respective indicators to develop a comprehensive matrix.

J-SCTF was invited to nominate a speaker for the SPCG workshop on “Bridging the coordination and collaboration gap”. It was agreed to establish a World Smart City Forum (WSCF) 2023 preparation steering group. On Day 2, a technical visit to *“Anyang Smart City Integrated Control Center”* and *“NAVER 1784 Robot Intelligent Building”* were arranged and followed by a workshop with stakeholders from three cities in the Republic of Korea.

The 8th J-SCTF meeting took place physically in Geneva, Switzerland, from 27–28 March 2023. The meeting was chaired by ISO Co-chairman Mr Bernard Gindroz (Chairman, ISO/TC 268).

Agreed Task & Finish (T&F) group action items:

***T&F group 2: Mapping exercise on the existing SDOs work in smart and sustainable cities***

* Reported on mapping with the accepted comments and will continue its work at least until Barcelona event (November 2023).

***T&F group 3: SDGs and link with smart cities activities***

* Will continue to work on a report/short guidance for cities to be presented at the WSCF in Barcelona in November 2023, and for a long-term structured report on cities and SDGs.

***New T&F group 4: Data and data sharing***

* To start work on the draft ToR for this new T&F group

It was agreed by the J-SCTF members and leaders to progress with the proposal for a WSCF for seeking three CEOs’ endorsement.

The next meeting meeting is planned to take place virtually from 10–11 July 2023.

## 4.4 Collaboration with IEEE

During the ITU-T SG20 opening plenary that took place on 17 May 2021, the collaboration between ITU and IEEE was introduced. Mr Gyu Myoung Lee, Q4/20 Rapporteur, was designated as ITU-T SG20 focal point. After that, there were several e-meetings on the Global observatory for urban intelligence (GOUI).

During the 26th JCA-IoT and SC&C meeting that took place on 19 July 2022, Mr Gyu Myoung Lee, ITU Focal Point, gave a verbal presentation on the collaboration activities with IEEE. Mr Lee highlighted that there was good collaboration with IEEE on the global observatory for urban intelligence.

Based on recent discussions with IEEE, it was tentatively agreed to prepare a couple of Technical Reports, especially one on Smart City Ontology, to expand on the SSC semantics.

On IEEE’s side, IEEE has identified some key experts to work on this topic. Mr Lee will consult with TSB to identify experts on the ITU-T side, including those working on the data project within the [AI for Data Commons](https://www.itu.int/en/ITU-T/extcoop/ai-data-commons/Pages/default.aspx#:~:text=The%20Global%20Initiative%20on%20AI,Nations%20Sustainable%20Development%20Goals%20(SDGs)).

The verbal presentation and discussion were noted with appreciation.

## 4.5 Collaboration with IEC SyC Smart Cities

*IEC SyC Smart Cities – Working Group 3 “Reference Architecture”*

ITU-T SG20 received the following Liaison Statements:

* [TD104](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0104) on “LS/i on proposal for joint work on Smart Cities Reference Architecture (SCRA)”
* [TD181](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0181) on “LS/i on proposal for joint work on Smart Cities Reference Architecture (SCRA)”

An outgoing Liaison Statement (See [TD327-R2](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-220718-TD-GEN-0327)) has been sent to IEC SyC Smart Cities.

*IEC SyC Smart Cities – Joint Working Group on City Information Modelling and Urban Digital Twins*

During the JCA IoT and SC&C meeting that took place on 31 January 2023, in Geneva, Switzerland, the following has been presented by Jun Seob Lee, Liaison Rapporteur:

* [TD539](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0539) - Liaison Report for Joint Working Group on City Information Modelling and Urban Digital Twins

**4.6 Collaboration with LoRa Alliance**

During the JCA IoT and SC&C meeting that took place on 31 January 2023, in Geneva, Switzerland, LoRa Alliance provided an update on their activities and shared information on their approval process.

LoRa Alliance experts attended the Q3/20 sessions and contributed to the discussions surrounding the revision of Recommendation ITU-T Y.4480.

**4.7 Collaboration with ASTM**

[TD550](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0550) on “Analysis for qualification of ASTM according to ITU-T A.4, A.5 and A.6” was presented by TSB at the SG20 Opening Plenary, as requested by SG20 (see [SG20-R1](https://www.itu.int/md/T22-SG20-R-0001/en), July 2022). The analysis in the TD focused on whether the ASTM characteristics meet the A.5 and A.6 qualification criteria, as ASTM is a regional/national standards development organization. Provisions related to general licensing commitments for declared standard essential patents are not covered in the ASTM’s organization-wide IPR policies, but are included in each of its committee’s policies, and those provisions are not identical. The secretariat considers that the absence of such provisions in the organization-wide IPR policy is a point of discrepancy with the Common Patent Policy for ITU-T/ ITU-R/ISO/IEC and the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC. ITU-T SG20 decided to defer its decision on qualification until further action has been taken by ASTM with regard to their IPR policies.

**4.8 Collaboration with AIOTI**

[TD553](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0553) on “Analysis for qualification of AIOTI according to ITU-T A.4, A.5 and A.6” was presented by TSB at the SG20 closing plenary as per request by SG20 (see [SG20-R1](https://www.itu.int/md/T22-SG20-R-0001/en), July 2022). AIOTI clarified that they do not develop any standards, nor are they a regional/national SDO; hence, the TD focused on whether the AIOTI characteristics meet the A.4 qualification criteria.

Taking into consideration information provided by [TD553](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0553), SG20 approved the A.4 qualification for AIOTI, noting that AIOTI does not develop any standards.

**4.9 Digital Transformation Resource Hub**

The newly created Digital Transformation Resource Hub provides a wide range of quality publications on digital transformation topics, including smart sustainable cities, cities' actions to tackle COVID-19, artificial intelligence, Internet of Things, blockchain, digital twin, metaverse and digital transformation trends. All resources are freely available to everyone. It can be found at: <https://www.itu.int/cities/dt-resource-hub/>.

# Correspondence group for Artificial intelligence of Things (CG-AIoT)

A CG-AIoT Session took place on 1 February 2023, from 1400 to 1530 hours, Geneva time.

At the meeting, the CG-AIoT under Question 4/20 discussed two Contributions. Q4/20 produced the output document for YSTP.AIoT and the meeting report.

In the SG20 closing plenary, the meeting report ([TD696-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0696)) was approved, along with the lifetime extension until the next SG20 meeting to be held on 13–22 September 2023.​

# ITU-T Focus Group on “Artificial Intelligence (AI) and Internet of Things (IoT) for Digital Agriculture” (FG-AI4A)

During the SG20 meeting that took place from 30 January – 10 February 2023, FG-AI4A Co-chairmen, Dr Ramy Fathy and Dr Sebastian Bosse, presented the FG-AI4A Progress Report (from July 2022 – January 2023), as contained in [TD549](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0549). This presents the main activities of the FG-AI4A, including an overview of the discussions that took place during the third to fifth meetings respectively. The Progress Report also underscores the current FG-AI4A structure, list of deliverables and Management Team, along with the workshops and webinars held within the reporting period. It also includes the updated timeline for the completion of the FG-AI4A deliverables.

The third, fourth and fifth meeting of FG-AI4A were organized as follows:

* third meeting of FG-AI4A, Seongnam (Republic of Korea) 25–26 August 2022 (preceded by the onsite Workshop on 24 August 2022)
* fourth meeting of FG-AI4A, Virtual, 17–19 October 2022
* fifth meeting of FG-AI4A, Virtual, 20 January 2023

The next meeting (and sixth) of the FG-AI4A is planned to take place virtually from 22–24 May 2023.

# ITU-T Study Group 20 Meetings

ITU-T SG20 held a meeting from 30 January – 10 February 2023, in Geneva, Switzerland. See [Report 4](https://www.itu.int/md/T22-SG20-R-0004/en) for additional details on the last SG20 meeting.

The third meeting of ITU-T SG20 of this study period (2022–2024) will be held from 13–22 September 2023, in Arusha, Tanzania.

# JCA IoT and Smart Cities & Communities

The scope of the [JCA-IoT and SC&C](https://www.itu.int/en/ITU-T/jca/iot/Pages/default.aspx) is to coordinate the ITU-T work on the “Internet of Things and Smart Cities and Communities” and provide a visible contact point for IoT and its applications, including smart cities and communities (SC&C) activities within ITU-T. This would also help to coordinate with external bodies working in IoT and SC&C, and enable effective, two‑way communication with these bodies. External bodies include representatives from relevant SDOs such as IEC, ISO, relevant academia, consortia and fora.

The JCA-IoT and SC&C maintains an IoT and SC&C standards roadmap, which documents complete and also ongoing work on IoT and SC&C carried out by ITU-T, as well as by other SDOs and Forums. The IoT and SC&C standards roadmap is available [online](https://www.itu.int/itu-t/landscape/?topic=t&group=g&search_text=) and as [Supplement ITU-T Y.Suppl.58](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=14176) “Internet of Things and smart cities and communities standards roadmap”.

Since November 2022, the JCA IoT and SC&C has held the following meeting:

* Twenty seventh meeting, Geneva, 31 January 2023.

The twenty-eighth meeting of the JCA IoT and SC&C will be held in September 2023, in Arusha, Tanzania, in conjunction with the ITU-T SG20 meeting.

# ITU-T Study Group 20 Regional Groups

The following are the updates from the ITU-T SG20 Regional Groups since the last SG20 meeting:

* [SG20 Regional Group for the Africa Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgafr/Pages/default.aspx) – see section 10.
* [SG20 Regional Group for the Arab Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgarb/Pages/default.aspx) – none.
* [SG20 Regional Group for the Latin America Region](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rglatam/Pages/default.aspx) – none.
* [SG20 Regional Group for Eastern Europe, Central Asia and Transcaucasia](https://www.itu.int/en/ITU-T/studygroups/2017-2020/20/sg20rgeecat/Pages/default.aspx) – none.
* [SG20 Regional Group for Asia and the Pacific](https://www.itu.int/en/ITU-T/regionalgroups/sg20-ap/Pages/default.aspx)

During the ITU-T SG20 plenary that took place on 8 February 2023, it was agreed to create the new ITU-T SG20 Regional Group for Asia Pacific (SG20RG-AP).

The ITU-T SG20 Regional Group for Asia Pacific (SG20RG-AP) – SG20RG-AP Management team, Terms of Reference and list of Member States are contained in [TD711-R1](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-SG20-230130-TD-GEN-0711).

See the SG20RG-AP webpage available [here](https://www.itu.int/en/ITU-T/regionalgroups/sg20-ap/Pages/default.aspx).​ See also section 10.

# Future events and dates of next ITU-T Study Group 20 meeting and Regional Group meetings

* A series of e-meetings and forums will take place in 2023 and 2024;
* The [ITU Digital transformation Webinar Series](https://www.itu.int/cities/standards4dt/) is taking place throughout 2023;
* The meeting of SG20 Regional Group for the Africa Region will take place on 8 June 2023, in Sharm El-Sheik, Egypt;
* The meeting of SG20 Regional Group for Asia and the Pacific will take place virtually from 25–26 July 2023; and
* The next meeting of ITU-T SG20 will take place from 13–22 September 2023, in Arusha, Tanzania.

# Other activities

Please see below the upcoming events:

* [Webinar series on Digital transformation](https://www.itu.int/cities/standards4dt/)  
  Virtual, 2023
  + Episode on Digital transformation of mobility: paving the way for road safety (14 June 2023)
  + Episode on Digital transformation of testing: federated testbeds as a service (21 June 2023)
  + Episode on Ethical use of technology for animals: is digital transformation fair in animal husbandry and biodiversity conservation (26 July 2023)
  + Episode on Decade of healthy aging: role of digital technologies (22 August 2023)
  + Episode on ChatGPT: risks and rewards of generative AI in cities (4 September 2023)
  + Episode on Digital tourism: bridging the gap between communities and destinations (27 September 2023)
  + Episode on “Fashioning” the metaverse to accelerate digital transformation: what has gone out of style (2 October 2023)
  + Episode on Disaster risk reduction in the digital transformation age (13 October 2023)
  + Episode on World cities day: digital transformation for a better urban life (31 October 2023)
  + Episode on Digital transformation in the pharma Industry (14 November 2023)
  + Episode on Buildings in action: the intersection of digital transformation smart technology and sustainability in cities (28 November 2023)
  + Episode on Harnessing digital transformation for smart manufacturing (12 December 2023)

Since November 2022, a series of events on IoT and SSC have been held:

* **DT Episode #17**: [Emergency responses in smart cities: Driving resilience in the post-pandemic era](https://www.itu.int/en/ITU-T/webinars/DT4CC/20221122/Pages/default.aspx) (22 November 2022​)
* **DT Episode #18**:​ ​​[Cities in the age of artificial intelligence: How to leverage technology for digital transformation​](https://www.itu.int/en/ITU-T/webinars/DT4CC/20221123/Pages/default.aspx) (​23 November 2022)
* **DT Episode #19**: [Tourism in smart cities: Reimagining the road to digital tourism](https://www.itu.int/en/ITU-T/webinars/DT4CC/20221207A/Pages/default.aspx) (07 December 2022)
* **DT Episode #20**: [A one-of-a-kind platform for digital transformation: the U4SSC Austrian Country Hub​](https://www.itu.int/en/ITU-T/webinars/DT4CC/20221207B/Pages/default.aspx) (07 December 2022)
* **DT Episode #21**: [Digital Agriculture: Driving Digital Transformation for Food Security](https://www.itu.int/cities/?page_id=550&preview=true)​​​​ (17 February 2023​)
* **DT Episode #22**: [Digital water in smart sustainable cities](https://www.itu.int/cities/standards4dt/ep22/) (14 March 2023)
* **DT Episode #23**: [STI Forum Side event on Building the pathway to sustainable digital transformation](https://www.itu.int/cities/standards4dt/ep23/) (2 May 2023)
* **DT Episode #24**: [STI Forum Side event on Building back smarter and more sustainable cities through the United for Smart Sustainable Cities Initiative](https://www.itu.int/cities/standards4dt/ep24/) (3 May 2023)
* **DT Episode #25**: [STI Forum Side event on Leveraging the metaverse in cities to achieve the SDGs](https://www.itu.int/cities/standards4dt/ep25/) (4 May 2023)

**United for Smart Sustainable Cities (U4SSC) initiative**

The [United for Smart Sustainable Cities (U4SSC) initiative](https://u4ssc.itu.int/) is a United Nations initiative coordinated by the International Telecommunication Union (ITU), the United Nations Economic Commission for Europe (UNECE) and the United Nations Human Settlements Programme (UN-Habitat) and supported by 16 other United Nations Agencies and Programmes (CBD, ECLAC, FAO, UNDESA, UNESCO, UNDP, UNECA, UN-Women, UNEP, UNEP-FI, UNFCCC, UNIDO, UNOP, UNU EGOV, UNWTO and WMO).

The [Seventh Meeting of the United for Smart Sustainable Cities (U4SSC) Initiative](https://u4ssc.itu.int/latest-meetings/7th-meeting/) will take place virtually on 20 June 2023.

U4SSC is currently working on the following Thematic Groups:

* City platforms
  + Working Group 5: Reference framework for an integrated management of a smart sustainable city
  + Working Group 6: Data and APIs in Smart City Platforms
* Lessons Learned from Building Urban Economic Resilience at City Level During and After COVID-19​
* Guiding principles for Artificial Intelligence in cities
* Procurement guidelines for Smart Cities and Communities
* Enabling People-Centred Cities through Digital Transformation
  + Working Group 1: Setting the Context: Digital Transformation for People-oriented Cities
  + Working Group 2: Policy Benchmarks for Digital Transformation for People-oriented Cities
  + Working Group 3: Digital Transformation Assessment for People-oriented Cities
  + Working Group 4: Guidelines for Unlocking Net Zero in Cities Through Sustainable Digital Transformation
  + Working Group 5: Methodology for Measurement of GHG Emissions in Smart Sustainable Cities

The following deliverables were published:

* ​[Procurement guidelines for smart sustainable cities](https://www.itu.int/en/publications/Documents/tsb/2023-U4SSC-Procurement-guidelines-for-SSC/index.html#p=1)
* [Compendium of practices on innovative financing for smart sustainable cities projects](https://www.itu.int/en/publications/Documents/tsb/2023-U4SSC-Compendium-Practices-Innovative-Financing-SSC-Projects/index.html#p=1)

**Key performance indicators for smart sustainable cities project**

The U4SSC developed a set of international key performance indicators (KPIs) for Smart Sustainable Cities (SSC) to establish the criteria to evaluate ICT´s contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments in order to achieve the sustainable development goals (SDGs). These KPIs for SSC are based on an international standard – [Recommendation ITU-T Y.4903 on Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals](https://www.itu.int/ITU-T/recommendations/rec.aspx?id=12884&lang=en) – and were developed within the framework of the United for Smart Sustainable Cities initiative. More than 150 cities worldwide are already implementing these KPIs.

The list of all the KPIs for SSC along with its collection methodology are contained in the:

* [Flipbook on “Collection Methodology for Key Performance Indicators for Smart Sustainable Cities”.](https://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Collection-Methodology/index.html)

As part of the work on the implementation of the U4SSC KPIs for smart sustainable cities, the following Snapshots, Verification Reports and Case studies were launched:

City Snapshots:

* [Tromsø, Norway](https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-City-Snapshot-Tromso-Norway/index.html)
* [Kyebi, Ghana](https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-City-Snapshot-Kyebi-Ghana/index.html#p=1)
* Canton of Geneva, Switzerland

Verification Reports:

* [Tromsø, Norway](https://www.itu.int/en/publications/Documents/tsb/2022-U4SSC-Verification-Report-Tromso-Norway/index.html)
* Canton of Geneva, Switzerland

In addition, U4SSC is also developing several City Snapshots and Verification Reports to highlight the performance of cities in the implementation of KPIs.

* Anyang, Korea (Republic of)

# Annex 1

**Achievements of ITU-T Study Group 20 on Internet of Things (IoT) and Smart Cities and Communities (SC&C)  
(status 08 May 2023)**

1. **Recommendations approved**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | ITU-T Y.4601 | Requirements and capability framework of digital twin for smart firefighting |
| 20 | ITU-T Y.4500.3 | oneM2M - Security solutions |
| 20 | ITU-T Y.4560​ | Blockchain-based data exchange and sharing for supporting Internet of things and smart cities and communities |
| 20 | ITU-T [Y.4218](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17885) | IoT and ICT requirements for deployment of smart services in rural communities |
| 20 | ITU-T Y.4219 | Accessibility requirements for user interface of smart applications supporting IoT |
| 20 | ITU-T Y.4220 | Requirements and capability framework of abnormal event detection system for smart home |
| 20 | ITU-T Y.4485 | Requirements and Reference Architecture of Smart Education |
| 20 | ITU-T Y.4486 | Framework of cross edge decentralized service by using DLT and edge computing technologies for IoT devices |
| 20 | ITU-T Y.4602 | Data processing and management framework for IoT and smart cities and communities |
| 20 | ITU-T Y.4603 | Requirements and functional model to support data quality management in IoT |
| 20 | ITU-T Y.4909 | Assessment framework of IoT sensing quality |
| 20 | ITU-T Y.4910 | Maturity model of digital supply chain for smart sustainable cities |

1. **Implementer's guide approved**

**None.**

1. **Deleted Recommendations**

**None.**

1. **Agreed informative texts**

|  |  |  |
| --- | --- | --- |
| **SG** | **No** | **Title** |
| 20 | YSTR.BP-DTw | Best Practices for Graphical Digital Twins of Smart Cities |
| 20 | ITU-T Y.Suppl.73​ | Concept and use cases of a digital twin in smart sustainable ​cities |

# Annex 2

**Current work programme of ITU-T Study Group 20 on Internet of Things (IoT) and Smart Cities and Communities (SC&C)   
(status 8 May 2023)**

**Working Party 1/20**

1. **Q1/20 - Interoperability and interworking of IoT and SC&C applications and services**

|  |  |  |
| --- | --- | --- |
| **SG** | **No** | **Title** |
| 20 | [Y.DRI-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18457) | Requirements for autonomous urban delivery robots interworking |
| 20 | [Y.dtf-infoex](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18456) | Information exchange model for digital twin federation in smart cities and communities |
| 20 | [Y.dtf-rach](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18455) | Reference architecture of digital twin federation in smart cities and communities |
| 20 | [Y.dtf-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17951) | Requirements for digital twin federation in smart cities and communities |
| 20 | [Y.isms](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17882) | Functional framework and requirements for disaster monitoring system |
| 20 | [Y.MIM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18458) | Minimal Interoperability Mechanisms for Smart and Sustainable Cities and Communities |
| 20 | [Y.nmm-isms](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17883) | Metadata model of sensing capability for disaster monitoring system |
| 20 | [YSTR.ACC-SCC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18454) | Guidelines on developing ICT services for accessible smart cities |

**b) Q2/20 - Requirements, capabilities and architectural frameworks across verticals enhanced by emerging digital technologies**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.4221 (ex Y.ElecMon-Reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17933) | Requirements of IoT-based electric power infrastructure monitoring system |
| 20 | [Y.4222 (ex Y.smart-evacuation)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17886) | Framework of smart evacuation in a disaster and/or an emergency in smart cities and communities |
| 20 | [Y.4223 (ex Y.SCC-Reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17889) | Common requirements and capabilities of smart cities and communities from IoT and ICT perspectives |
| 20 | [Y.BC-SON](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17903) | Framework of blockchain-based self-organization networking in IoT environments |
| 20 | [Y.dt-ITS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17947) | Requirements and capability framework of digital twin for intelligent transport system |
| 20 | [Y.dt-IWCS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18459) | Requirements and capability framework of digital twin for intelligent water conservancy system |
| 20 | [Y.dt-SComCam](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18750) | Common requirements and capability framework of digital twin for smart complex and campus |
| 20 | [Y.EMM-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17952) | Requirements for Real-Time Event Monitoring and Integrated Management in Smart City Platforms |
| 20 | [Y.energy-storage](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18749) | Requirements and capability framework of energy storage service for residential community in smart city |
| 20 | [Y.EV-charging](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17954) | Requirements of smart charging service for electric vehicles |
| 20 | [Y.FSPH](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18460) | Framework for smart public health emergency management in smart and sustainable cities |
| 20 | [Y.IIoT-infra-SM-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17949) | Requirements and framework of Industrial IoT (IIoT) infrastructure for smart manufacturing |
| 20 | [Y.IoT-BC-reqts-cap](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17932) | IoT requirements and capabilities for support of blockchain |
| 20 | [Y.IoT-BPM-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17891) | Specific Requirements of the Internet of Things for Business Process Management |
| 20 | [Y.IoT-RTPS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18461) | Use cases, requirements and capabilities of Internet of Things infrastructures in roadside traffic perception system |
| 20 | [Y.IoT-SFFS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17955) | Requirements and Reference functional model of IoT-based smart forest firefighting system |
| 20 | [Y.IoT-SmartBuild](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17898) | Common requirements and capabilities of smart buildings from the IoT perspective |
| 20 | [Y.IoT-Vreqs](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17953) | Requirements and capability framework of the internet of things for vision |
| 20 | [Y.PGComNet-Reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18748) | Requirements of IoT-based power grid communication network |
| 20 | [Y.RemoteEd](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18751) | Requirements, capabilities and architectural frameworks for e-learning in remote classrooms |
| 20 | [Y.Sup.SmartAgri-usecases](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17912) | Use cases of IoT based smart agriculture |
| 20 | [Y.Sup.SmartAqua-usecases](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18753) | ITU-T Y.4000-series – Use cases of IoT-based smart aquaculture |
| 20 | [Y.water-SFP](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17907) | Framework of monitoring of water system for smart fire protection |
| 20 | [YSTR.Ambient IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18752) | Analysis on requirements and use cases of ambient power-enabled IoT |

**c) Q3/20 - IoT and SC&C architectures, protocols and QoS/QoE**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.4480Rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18747) | Low power protocol for wide area wireless networks |
| 20 | [Y.4487 (ex Y.RMDFS-arch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17950) | A functional architecture of roadside multi-sensor data fusion systems for autonomous vehicles |
| 20 | [Y.AI-DECCS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17929) | Functional architecture of AI enabled device-edge-cloud collaborative services for IoT and smart city |
| 20 | [Y.arc-psfws](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18746) | A functional architecture of power supply facilities warning system |
| 20 | [Y.CDML-arc](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17938) | Reference architecture of collaborative decentralized machine learning for intelligent IoT services |
| 20 | [Y.cnce-IoT-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17894) | Functional architecture of network capability exposure for smart hospital based on Internet of things |
| 20 | [Y.dec-IoT-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17893) | Decentralized IoT communication architecture based on information centric networking and blockchain |
| 20 | [Y.IoT-AOS-prot](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17901) | Autonomic operations support protocols in the Internet of things |
| 20 | [Y.IoT-BoT-peer](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17936) | Capability and functional architecture of peer of blockchain of things |
| 20 | [Y.IoT-CONV-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17958) | Convergence framework for enhancement of service intelligence based on Internet of Things |
| 20 | [Y.IoT-DPE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18745) | Management framework for IoT-based distributed power equipment |
| 20 | [Y.IoT-NCM-arch](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18462) | Functional architecture of network connectivity management in the Internet of things |
| 20 | [Y.IoT-rmc](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17887) | Reference architecture of accessing IoT resources for management and control |
| 20 | [Y.IoT-SQMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17937) | Requirements and functional architecture of IoT sensing quality management service |
| 20 | [Y.NCE.arch.EIoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17934) | Functional architecture enhancement with network capability exposure to support flexible QoS/QoE requirements from enterprise IoT services and applications |
| 20 | [Y.RA-FML](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17924) | Requirements and reference architecture of IoT and smart city & community service based on federated machine learning |
| 20 | [Y.RA-PHE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17921) | Requirements and reference architecture of smart service for public health emergency |
| 20 | [Y.RA-SDL](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17926) | Functional architecture for smart door lock service framework |
| 20 | [Y.smart-PBRS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17925) | Functional Architecture of Smart Power Bank Rental Service Framework |
| 20 | [Y.Smart-SBS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17923) | Requirements and functional architecture of smart sharing bicycle service |
| 20 | [Y.Sup.IoT-CONV (ex YSTR.IoT-CONV)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17959) | Overview of IoT Convergence |
| 20 | [Y.TM.DM-API](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17920) | IoT Device Management API REST Specification |
| 20 | [Y.TM.SM-API](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17919) | IoT Service Management API REST Specification |
| 20 | [YSTR.SemComm.IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17960) | Architectural Framework for Semantic Communication Services for IoT and Smart City & Community |

**d) Q4/20 - Data analytics, sharing, processing and management, including big data aspects, of IoT and SC&C**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.4488 (ex Y.IoT-SPWE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17945) | Framework of IoT service for safety protection of working environment |
| 20 | [Y.4604 (ex Y.IoT-MCSI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17956) | Metadata for camera sensing information of autonomous mobile IoT devices |
| 20 | [Y.cii (ex Y.rrm-data)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17900) | Requirements and reference model of IoT related data from city infrastructure |
| 20 | [Y.CL-EDM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18463) | Energy data model for city-level energy management platform |
| 20 | [Y.CSDL](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18744) | Requirements and framework for crowdsourced system based on distributed learning |
| 20 | [Y.dem-IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18743) | Data exchange model for IoT devices in power transmission and transformation equipment |
| 20 | [Y.DM-SLF](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18470) | Conceptual data model of smart livestock farming service |
| 20 | [Y.DPM-alm-fra](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18467) | Functional requirements and architecture of blockchain-based activity logs management for IoT data processing and management |
| 20 | [Y.DSGS-dms](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18464) | Requirements and functional architecture of data management system for smart greenhouse service |
| 20 | [Y.DSGS-reqts](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17957) | Requirements and a reference model of data for smart greenhouse service |
| 20 | [Y.energy-data](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17946) | Framework of city-level energy data sharing and analytics among buildings |
| 20 | [Y.IoT-CRE-fr](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18466) | Framework of common rule enablement for intelligent IoT services in heterogeneous IoT platform environments |
| 20 | [Y.SF-prediction](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18465) | Service framework of prediction for intelligent IoT |
| 20 | [Y.UIM-cs-framework](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17944) | Framework of urban infrastructure monitoring based on crowdsourcing |
| 20 | [YSTP.AIoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18471) | Challenges of and Guidelines to Standardization on Artificial Intelligence of Things |
| 20 | [YSTR.dscm](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18468) | Analysis of data sharing control models |

**Working Party 2/20**

**a) Q5/20 - Study of emerging digital technologies, terminology and definitions**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.Sup.DTAfrica](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17961) | Digital Transformation of Cities and Communities in Africa |
| 20 | [Y.Sup.DT-definition](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18472) | Digital transformation for people-centred smart cities and communities: an analysis of definitions |
| 20 | [Y.Sup.DTransf](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17939) | Digital transformation in the context of IoT, smart cities and communities |
| 20 | [YSTR.P2P-CC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17940) | Current state of P2P crowd charging platforms and corresponding market needs |

**b) Q6/20 - Security, privacy, trust and identification for IoT and SC&C**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.IoT-acs-fra](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18740) | Functional requirements and architecture of access control service of IoT platform enabled by zero trust technology in decentralized environments |
| 20 | [Y.IoT-Smartcity-Risk](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17916) | Reference framework of cybersecurity risk management of IoT ecosystems on smart cities |
| 20 | [YSTR.IoT-IMS](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18473) | Requirements and capability framework for identification management service of IoT device |
| 20 | [YSTR-IADIoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17917) | Intelligent Anomaly Detection System for IoT |

**c) Q7/20 - Evaluation and assessment of Smart Sustainable Cities and Communities**

| **SG** | **No** | **Title** |
| --- | --- | --- |
| 20 | [Y.Highway-KPI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18476) | Key performance indicators of ICT based highway traffic safety assessment |
| 20 | [Y.KHI-PE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18742) | Key health indicators and evaluation model for power equipment in Smart Sustainable Cities |
| 20 | [Y.KPEM-SM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18474) | Key performance evaluation models of smart manufacturing |
| 20 | [Y.KPI-Flood](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17963) | Key Performance Indicators of ICT based Urban Flood Disaster Prevention and Mitigation Capability |
| 20 | [Y.QE-DMI-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18475) | Quality evaluation of digital models in industry for smart sustainable cities |
| 20 | [Y.SSC-NGUM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17914) | A Methodology for Next Generation Urban Measurements |
| 20 | [Y.Sup.DTKPI](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17962) | Guidance and use case(s) to use digital technologies to visualize the key performance indicators of Recommendation ITU-T Y.4903 "Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals" |
| 20 | [Y.Sup.MM-EDMC-SSC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18741) | Maturity model of digital management capability of industrial equipment used in smart sustainable cities |
| 20 | [Y.Sup-NGUM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17915) | Use Cases for Next Generation Urban Measurements |
| 20 | [Y.Sup-SSC-UCE](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17910) | Use Cases on implemented or evaluated SSC solutions based on ITU-T Y.4900 Recommendation Series |
| 20 | [YSTR.HTSA-overview](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18477) | Overview of ICT based highway traffic safety assessment |

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