

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

WORLD TELECOMMUNICATION STANDARDIZATION
ASSEMBLY
Geneva, 1-9 March 2022

**Resolution 98 – Enhancing the standardization
of Internet of Things and smart cities and
communities for global development**

ITU-T



FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

© ITU 2022

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

RESOLUTION 98 (Rev. Geneva, 2022)

Enhancing the standardization of Internet of Things and smart cities and communities for global development

(Hammamet, 2016; Geneva, 2022)

The World Telecommunication Standardization Assembly (Geneva, 2022),

recalling

- a)* Resolution 197 (Rev. Dubai, 2018) of the Plenipotentiary Conference, on promoting the development of the Internet of things (IoT) and smart sustainable cities and communities (SC&C);
- b)* Resolution 66 (Rev. Sharm el-Sheikh, 2019) of the Radiocommunication Assembly, on studies related to wireless systems and applications for the development of IoT;
- c)* Resolution 85 (Rev. Buenos Aires, 2017) of the World Telecommunication Development Conference, on facilitating IoT and SC&C for global development;
- d)* the Global Pulse initiative launched by the United Nations Secretary-General to promote opportunities to use big data for sustainable development and humanitarian action;
- e)* the objectives of the ITU Telecommunication Standardization Sector (ITU-T) in Resolution 71 (Rev. Dubai, 2018) of the Plenipotentiary Conference, and in particular Objective T.5, which mandates ITU-T to extend and facilitate cooperation with international, regional and national standardization bodies;
- f)* Recommendation ITU-T Y.4000/Y.2060, on overview of IoT, which defines IoT as "a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies";
- g)* Recommendation ITU-T Y.4702, on common requirements and capabilities of device management in IoT, which establishes common requirements and capabilities of device management in IoT for different application scenarios,

considering

- a)* that it is expected that the development of IoT technologies will make it possible to connect billions of devices to the network, impacting almost all aspects of daily life;
- b)* the importance of IoT in contributing to achievement of the 2030 Agenda for Sustainable Development, in particular recalling Sustainable Development Goal 11 (SDG 11) (Make cities and human settlements inclusive, safe, resilient and sustainable);
- c)* that various industrial sectors, such as energy, transportation, health and agriculture, are collaborating for the development of IoT and SC&C applications and services across verticals;
- d)* that IoT and SC&C can be key enablers for the information society and offer the opportunity to transform the urban infrastructure, taking advantage, among other things, of the efficiencies of smart buildings and transport systems, and smart water management, working together with services for the benefit of users;
- e)* that SC&C can use IoT to discover and respond to regional and/or global crises such as natural disasters and epidemics/pandemics;

- f) that research and development in IoT can help to improve global development, delivery of basic services and monitoring and evaluation programmes in different sectors;
- g) that IoT involves various stakeholders and areas, which may require coordination and cooperation;
- h) that IoT has evolved into a wide variety of applications with different aims and requirements, as a result of which it is necessary to work in coordination with other international standardization bodies and other related organizations in order to integrate better standardization frameworks;
- i) that technical standards as well as public-private partnerships should reduce the time and cost for implementing IoT with benefits in terms of economies of scale;
- j) that ITU-T should play a leading role in the development of IoT-related and SC&C-related standards;
- k) the importance of collaboratively assessing and standardizing IoT and SC&C data interoperability;
- l) that IoT and SC&C may have an impact in many areas, which may require further cooperation between national, regional and international entities concerned on relevant aspects in order to maximize the benefits of IoT;
- m) that in IoT and SC&C environments, connected devices and applications represent a diverse range of ecosystems;
- n) that security aspects are a key component in the development of a reliable and secure IoT ecosystem,

recognizing

- a) that industry forums, standards-development organizations (SDOs) and partnership projects are developing technical specifications for IoT;
- b) the role of the ITU Radiocommunication Sector (ITU-R) in conducting studies on the technical and operational aspects of radio networks and systems for IoT;
- c) the role of the ITU Telecommunication Development Sector (ITU-D) in encouraging telecommunication/information and communication technology (ICT) development at the global level, and in particular the relevant work carried out by ITU-D study groups;
- d) that the purpose of the Joint Coordination Activity on Internet of things and smart cities and communities (JCA-IoT and SC&C), under the leadership of ITU-T Study Group 20, is to coordinate the work on IoT and SC&C within ITU, and to seek cooperation from external bodies working in the field of IoT and SC&C;
- e) that much progress has been made in efforts to develop collaboration between ITU-T and other organizations, such as, but not limited to, active participation in different committees and working groups of Joint Technical Committee 1 of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC 1) and of the European Telecommunications Standards Institute (ETSI), and there has also been collaboration with forums such as oneM2M, the Alliance for Internet of Things Innovation and the LoRa Alliance, and collaboration on intelligent transport system (ITS) communication standards;

f) that Study Group 20 is responsible for studies and standardization work relating to IoT and its applications, including SC&C;

g) that Study Group 20 is also a platform where the ITU-T membership, including Member States, Sector Members, Associates and Academia, can come together to exert an impact on the drafting of international standards for IoT and their implementation;

h) that United for Smart Sustainable Cities (U4SSC) is a United Nations initiative coordinated by ITU, the United Nations Economic Commission for Europe (UNECE) and the United Nations Human Settlements Programme (UN-Habitat) to achieve SDG 11;

i) that U4SSC is supporting cities to leverage the full potential of ICT in sustainable development,

resolves to instruct Study Group 20 of the ITU Telecommunication Standardization Sector

1 to develop ITU-T Recommendations aimed at implementing IoT and SC&C, including, but not limited to, on issues related to emerging technologies and vertical industries;

2 to continue, within its mandate, to work with a special focus on the design of a roadmap and harmonized and coordinated international telecommunication standards for the development of IoT, taking into account the needs of each region and Member States, as well as the wide variety of use cases and applications, and the need for IoT to be open and adaptable, and fostering a competitive environment;

3 to collaborate with IoT-related standards organizations and other stakeholders such as industry forums and associations, consortia and SDOs, as well as other relevant ITU-T study groups, taking into account relevant work;

4 to collate, evaluate, assess and share IoT use cases from the interoperability and standardization standpoints for data and information exchange,

instructs the Director of the Telecommunication Standardization Bureau

1 to provide necessary assistance in order to take advantage of every opportunity, within the assigned budget, to promote quality standardization work in a timely manner, and to communicate with telecommunication and ICT industries in order to promote their participation in ITU-T's standardization activities on IoT and SC&C;

2 to carry out, in collaboration with Member States and cities, pilot projects in cities related to SC&C key performance indicator (KPI) assessment activities, aimed at facilitating the deployment and implementation of IoT and SC&C standards worldwide;

3 to continue to support U4SSC, and share its deliverables with Study Group 20 and other study groups concerned;

4 to promote and encourage the implementation of U4SSC KPIs as a standard for smart sustainable cities' self-assessment in collaboration with Member States;

5 to continue encouraging cooperation with other international SDOs, industry forums, other related organizations, and global projects and initiatives, in order to increase the development of international telecommunication standards and reports that facilitate the interoperability of IoT services,

instructs the Director of the Telecommunication Standardization Bureau, in collaboration with the Directors of the Telecommunication Development Bureau and the Radiocommunication Bureau

- 1 to prepare reports considering, in particular, the needs of developing countries¹ in terms of the study of IoT and its applications, sensor networks, services and infrastructure, taking into account the results of work being done in ITU-R and ITU-D to ensure coordination of efforts;
- 2 to provide support to Member States in implementing U4SSC KPIs for smart sustainable cities;
- 3 to foster joint work among ITU Sectors in order to discuss the various aspects related to the development of the IoT ecosystem and solutions for SC&C, in the context of the achievement of the SDGs and within the framework of the World Summit on the Information Society;
- 4 to continue disseminating ITU publications on IoT and SC&C, as well as organizing forums, seminars and workshops on the subject, taking into account the needs of developing countries in particular;
- 5 to support Member States, especially developing countries, in the organization of forums, seminars and workshops on IoT and SC&C to promote innovation, development and growth in IoT technologies and solutions;
- 6 to report to the next world telecommunication standardization assembly on progress made in the organization of forums, seminars and workshops dedicated to developing the capacity of developing countries;
- 7 to assist developing countries in the implementation of Recommendations, technical reports and guidelines related to IoT and SC&C,

invites the ITU Telecommunication Standardization Sector membership

- 1 to submit contributions and continue participating actively in the work of Study Group 20 and in the studies on IoT and SC&C being conducted by ITU-T;
- 2 to develop master plans and exchange use cases and best practices in order to promote the IoT ecosystem, as well as SC&Cs, and to promote social development and economic growth in order to achieve the SDGs;
- 3 to cooperate and exchange experiences and knowledge related to this topic;
- 4 to support and organize forums, seminars and workshops on IoT in order to promote innovation, development and growth in IoT technologies and solutions;
- 5 to take necessary measures to facilitate the growth of IoT in relation to areas such as the establishment of standards.

¹ These include the least developed countries, small island developing states, landlocked developing countries and countries with economies in transition.