
ISO/IEC JTC 1 "Information technology"

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JTC 1/WG 11 Business Plan 2020

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BUSINESS PLAN FOR ISO/IEC JTC 1/WG 11

Smart Cities

PERIOD COVERED: Nov,2019 – Nov. 2020

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1 EXECUTIVE SUMMARY

ISO/IEC JTC 1 WG 11 serves as the focus of and proponent for JTC 1's Smart Cities standardization program. WG 11 continuously recognized the urgent and emerging demands for standards regarding smart city and related new ICT to support city services and constructions.

In 2020, WG 11 keeps pushing the standard projects forward and exploring the strategic topics on Semantic Interoperability of City Data, Software Platform for Open City Data, Urban Operation System and City planning and smart modelling and simulation.

One virtual plenary meeting along with 11 e-meetings were held at this period. Another virtual plenary meeting and 9 e-meetings will be held by the end of 2020. 2 projects were finished as IS published, 2 projects are from CD to DIS, 1 project is from WD 1 to WD 5, 4 new projects were approved and registered, 1 PWI was approved and registered.

2 CONVENER'S REMARKS

2.1 Market Requirements, Innovation

Smart City is the area where technical committee or group is established in the main three international standardization organizations including ISO, IEC & ITU-T. These committees focus on different aspects of Smart City.

ISO/TC 268 Sustainable cities and communities will development requirements, frameworks, guidance and supporting techniques and tools related to the achievement of sustainable development considering smartness and resilience, to help all Cities and Communities and their interested parties in both rural and urban areas become more sustainable. ISO/TC 268/SC 1 is one subcommittee focusing on smart community infrastructures.

IEC/SyC Smart Cities is a system committee fostering the development of standards in the field of electro-technology to help with the integration, interoperability and effectiveness of city systems.

ITU-T SG 20 IoT & Smart cities and Communities is working to address the standardization requirements of Internet of Things (IoT) technologies, with an initial focus on IoT applications in smart cities and communities (SC&C).

For JTC1, there are many existing ICT standards that are used in smart city.

- Hardware technology for data capture, including sensors and the Internet of Things
- Data capture & identification
- Data management
- Privacy
- Security
- ICT networks
- Software engineering, including application technologies, cultural & linguistic adaptability, programming languages
- IT service management

For what JTC1/WG11 focused, the need for city data model and city operating platforms appears strong in the market.

2.2 Accomplishments

In 2020, WG 11 keeps pushing the standard projects forward and exploring the strategic topics on Semantic Interoperability of City Data, Software Platform for Open City Data, Urban Operation System and City planning and smart modelling and simulation.

2.2.1 Meetings

One virtual plenary meeting along with 11 e-meetings were held at this period. Another virtual plenary meeting and 9 e-meetings will be held by the end of 2020. Meeting list in 2020 is shown as following.

No.	Date	Topic
1	02/06	ISO/IEC AWI 24039 "Information technology –smart city digital platform"
2	02/14	Ad hoc group on the PWI proposal "City level digital infrastructural design for smart city"
3	03/31	ISO/IEC 30145-1 "Information technology —Smart City ICT Reference Framework — Part 1: Smart City Business Process Framework"
4	7/6 - 7/10	ISO/IEC JTC 1/WG 11 10 th Virtual Plenary Meeting

5	07/28	ISO/IEC 5087-1 "Information technology — City data model — Part 1: Foundation level concepts"
6	07/29	ISO/IEC 5087-2 "Information technology — City data model — Part 2: City level concepts"
7	07/30	ISO/IEC 5087-3 "Information technology — City data model — Part 3: Service level concepts -Transportation planning"
8	08/11	ISO/IEC 24039 "Information technology –smart city digital platform"
9	08/24	ISO/IEC 5087-1 "Information technology — City data model — Part 1: Foundation level concepts"
10	08/26	ISO/IEC 5087-2 "Information technology — City data model — Part 2: City level concepts"
11	08/27	ISO/IEC 5087-3 "Information technology — City data model — Part 3: Service level concepts -Transportation planning"
12	08/28	Ad hoc group(AHG) on reviewing the role of guidance documents for the implementation of ISO/IEC 30145, ISO/IEC 30146:2019 and ISO/IEC 21972:2019
13	09/23	Task Force of of Urban Operating System
14	09/29	ISO/IEC 5087-1 "Information technology — City data model — Part 1: Foundation level concepts"
15	10/02	Ad hoc group(AHG) on reviewing the role of guidance documents for the implementation of ISO/IEC 30145, ISO/IEC 30146:2019 and ISO/IEC 21972:2019
16	10/13	(1) ISO/IEC 5217 "Guidance on smart city digital infrastructure design" (2) ISO/IEC 24039 "Information technology — smart city digital platform"
17	10/22	ISO/IEC 5153 "Information Technology — Smart city — City service platform for public health emergency"
18	10/30	Ad hoc group(AHG) on reviewing the role of guidance documents for the implementation of ISO/IEC 30145, ISO/IEC 30146:2019 and ISO/IEC 21972:2019
19	11/16	(1) ISO/IEC 5087-1 "Information technology — City data model — Part 1: Foundation level concepts" (2) ISO/IEC 24039 "Information technology — smart city digital platform"
20	11/27	Ad hoc group(AHG) on reviewing the role of guidance documents for the implementation of ISO/IEC 30145, ISO/IEC 30146:2019 and ISO/IEC 21972:2019
21	12/15	ISO/IEC 5087-1 "Information technology — City data model — Part 1: Foundation level concepts"
22	12/14 - 12/18	ISO/IEC JTC 1/WG 11 11 th Virtual Plenary Meeting

2.2.2 Projects

In 2020, 2 projects were published, two projects are from CD to DIS, 1 project is from WD 1 to WD 5, 4 new projects were approved and registered, one PWI was approved and registered. WG 11 has totally initiated 11 projects in the domain of smart city. Updated status is shown as following.

No.	Projects	Status
1	Information technology — Smart city ICT indicators (ISO/IEC 30146:2019)	Published
2	Information technology — Upper level ontology for smart city indicators (ISO/IEC 21972:2020)	Published
3	Information technology — Smart City ICT reference framework — Part 3: Smart city engineering framework (ISO/IEC 30145-3:2020)	Published
4	Information technology — Smart City ICT reference framework — Part 1: Smart city business process framework (ISO/IEC DIS 30145-1)	DIS
5	Information technology — Smart City ICT reference framework — Part 2: Smart city knowledge management framework (ISO/IEC PRF 30145-2)	PRF
6	Information Technology — Smart city digital platform (ISO/IEC AWI 24039)	WD
7	Information technology — City data model — Part 1: Part 1: Foundation level concepts (ISO/IEC WD 5087-1)	WD
8	Information technology — City data model — Part 2: Part 2: City level concepts (ISO/IEC WD 5087-2)	WD
9	Information technology — City data model — Part 3: Part 3: Service level concepts -Transportation planning (ISO/IEC WD 5087-3)	WD
10	Information Technology — Smart city — City service platform for public health emergency (ISO/IEC WD 5153)	WD
11	Guidance on smart city digital infrastructure design (ISO/IEC PWI 5217)	PWI

2.2.3 New Ad hoc group

WG 11 established an ad hoc group (AHG) on developing a practical guidance on how to use international standard series of ISO/IEC 30145-1, ISO/IEC 30145-2, ISO/IEC 30145-3, ISO/IEC 30146:2019 and ISO/IEC 21972:2019, with the following **terms of reference**:

1. *To review how series of ISO/IEC 30145-1, 30145-2, ISO/IEC 30145-3, ISO/IEC 30146:2019 and ISO/IEC 21972:2019 might be positioned as a package of standards that can be effectively implemented together;*

2. *To review the best way to provide guidance to cities on how to use these;*
3. *To have a white paper on this topic;*
4. *To work closely with Task Force on the Pilot Implementation Programmes and Use Cases Study.*

2.3 Resources

Up-to-date, WG 11 have totally 199 registered members from 30 countries, and 11 liaison representatives and 19 document monitors.

Australia (SA)	Austria (ASI)	Belgium (NBN)	Canada (SCC)	China (SAC)	Denmark (DS)	Finland (SFS)
France (AFNOR)	Germany (DIN)	India (BIS)	Indonesia (BSN)	Ireland (NSAI)	Israel (SII)	Italy (UNI)
Japan (JISC)	Korea (KATS)	Luxemburg (ILNAS)	Malaysia (DSM)	Mexico (DGN)	New Zealand (NZSO)	Russia (GOSTR)
Saudi Arabia (SASO)	Singapore (SPRINGSG)	Slovenia (SIST)	South Africa (SABS)	Spain (UNE)	Sweden (SIS)	Switzerland (SNV)
United Kingdom (BSI)	USA (ANSI)					

3 COLLABORATION AND COOPERATION

3.1 Update of the liaison representatives

No.	Entities	LR to *
1.	JTC 1/ SC 7	Dapeng Zhang (CN): iecseg1@163.com
2.	JTC 1/SC 24	Chris Body (AU): chris.body@iinet.net.au
3.	JTC 1/SC 27	Jinghua Min (CN): minjinghua@qq.com
4.	JTC 1/SC 38	Dapeng Zhang (CN): iecseg1@163.com
5.	JTC 1/SC 41	Howard Choe (US): h_choe@yahoo.com
6.	JTC 1/SC 41/WG 4	Mark Fox (CA): msf@eil.utoronto.ca
7.	JTC 1/SC 41/WG 5	Chris Body (AU): chris.body@iinet.net.au
8.	JTC 1/SC 42	Howard Choe (US): h_choe@yahoo.com Tangli Liu (CN): liutangli1979@icloud.com
9.	ISO/TC 204/WG 1	Mark Fox (CA) : msf@eil.utoronto.ca
10.	ISO/TC 268	Chris Body (AU): chris.body@iinet.net.au
11.	ISO/TC 268/SC 1	Chris Body (AU): chris.body@iinet.net.au

No.	Entities	LR to *
12.	ISO/TC 268/WG 2	Dapeng Zhang (CN): iecseg1@163.com
13.	ISO/TC 268/WG 3	Mark Fox (CA) : msf@eil.utoronto.ca
14.	ISO/TC 268/WG 4	Hongwei Zhang (CN): zhanghw@cesi.cn Mark Fox (CA): msf@eil.utoronto.ca
15.	ISO/TC 211	Chris Body (AU): chris.body@iinet.net.au
16.	IEC/SyC Smart Cities	Howard Choe (US): h_choe@yahoo.com
17.	ITU-T SG 17-Security	Jinghua Min (CN): minjinghua@qq.com
18.	ITU-T/SG 20	Yun Li (CN): liyun_cetcisa@163.com
19.	ITU-T/JCA-IoT and SC&C	Yun Li (CN): liyun_cetcisa@163.com
20.	OGC	Peter Parslow (UK): Peter.Parslow@os.uk
21.	TM Forum	Michael Mulquin (UK): michael@iscommunications.co.uk

3.2 Requirement Investigation and cooperation strengthening

It is necessary to have strong relationships, with various kinds of objects:

- Market facing, listening to cities and communities, and their representatives, including technical suppliers to those cities. This would involve taking an active part in smart city activities – going where the customers are.
- organizationally horizontal, to avoid overlap or clarify distinct areas of working with:
 - ISO/TC 268 Sustainable cities and communities, especially SC 1 Smart community infrastructures, because their scope for “infrastructure” includes “ICT infrastructure”
 - IEC/SyC Smart Cities, because their systems engineering approach of necessity takes IT systems of the city into consideration
 - ISO/TC 204/WG 1 and WG 11 are both interested in the City data model and the industry application, and WG 11 is waiting for JTC1 approval to build formal liaison relationship with ISO/TC 204/WG 1.
- Several established JTC 1 new works are of relevance to smart city. This could benefit from being coordinated, to better provide a consistent picture to the users in this wide-ranging market sector.
 - WG 11 tried to establish the collaboration with JTC 1/SC 32 to ensure the data management related content in ISO/IEC WD 24039 is aligned with those in JTC 1/SC 32 projects.

- WG 11 received a liaison statement informing the new work item (Internet of Things (IoT) - General principles of evaluation indicator for IoT systems) from convenor of JTC 1/SC 41/WG 5.
- WG 11 tried to establish liaison relationship with JTC 1/SC 40 and its sub-groups.
- WG 11 arranged experts to participate in JTC 1/WG 13 on trustworthiness.

3.3 Establishment of Joint Ad-hoc Group with IEC Systems

WG 11 is waiting for JTC1 approval to set up a joint working group (JWG). With IEC SyC Smart City.

The Joint Ad-hoc Group (JAhG) between IEC SyC SmC and JTC 1/WG 11 on Smart Cities(SmC) has the following **terms of reference**:

1. *Study and discuss interrelationships between and among various types of SmC systems, applications, and services, and those technologies and components (both physical and virtual) that comprise them.*
2. *Survey the international standards currently existing and under development (if/when available), select those relevant to the ToR to evaluate for dependencies between them, if any.*
3. *Describe an overall view of Smart City operations, and from it, derive down to the essential city organizations' functions, applications, and services, and relating them to city's citizens, based on the current practice.*
4. *Identify data and information that would mutually benefit if they are shared and/or exchanged between selected the key city organizations.*
5. *Provide a draft study report within a year from the formal establishment of the JAhG.*
6. *The draft study report is to address the following:*
 - a. *The summary of the JAhG's activities and outcomes according to the ToR;*
 - b. *Any city applications or services that do not currently exist, if any, that can benefit a city and its citizens;*
 - c. *Recommendation of the next step for JAhG.*

4 DISCUSSION OF WG PROGRAM OF WORK

4.1 Uniqueness of Smart City ICT

- Software Platform for Open City Data

An important component of a smart city is the open availability of data for citizens and corporations to use. Cities throughout the world provide open data, but the services provided by their open data platforms vary from city to city. To date no standard has emerged for open data platforms.

- Semantic Interoperability of City Data

Semantic interoperability is a key constraint on the operation of e-Government, and can only be satisfied with the introduction of standards (Gottschalk, 2009). The information that cities use can be divided into several types.

- **Standard for Logging Smart City Applications**

As more of the operations of the city are automated using smart applications, the need for being able to detect and analyze the source of operational failures becomes increasingly important. Standards will be needed for logging the input, output, decisions and actions of these “smart” applications. The development of such standards will enable the development of forensic applications that would be able to determine the source and cause of failures, leading to improved performance over time.

- **Coordinating City Operations**

As more and more smart applications are introduced into city operations, the need for integration of their operation becomes increasingly important. Just as current city functions operate as silos with minimal interaction/coordination, these smart applications will also, unless standards are developed for how they are to interact and coordinate their decisions and actions.

- **Urban Operating System**

The advent of Smart Cities has seen an explosion of research, development and deployment of applications that take advantage of the convergence of technologies such as Artificial Intelligence, Web-based information systems, mobile technologies, and the Cloud.

- **Measurement of Smart City**

Smart cities need evaluation methods and indicators with which city stakeholders can understand the smart city performance from the ICT perspective. These evaluation methods and indicators focus on the efficient functioning of different systems, infrastructures and facilities. In addition, they also provide the guidance on how cities function holistically and facilitate innovation and growth in an integrated and coherent way.

4.2 Future work

The future works of WG 11 includes:

4.2.1 Finish the current projects on time

No.	Projects	Status
1	Information technology — Smart City ICT reference framework — Part 1: Smart city business process framework (ISO/IEC DIS 30145-1)	DIS

2	Information technology — Smart City ICT reference framework — Part 2: Smart city knowledge management framework (ISO/IEC PRF 30145-2)	PRF
3	Information Technology — Smart city digital platform (ISO/IEC AWI 24039)	WD
4	Information technology — City data model — Part 1: Part 1: Foundation level concepts (ISO/IEC WD 5087-1)	WD
5	Information technology — City data model — Part 2: Part 2: City level concepts (ISO/IEC WD 5087-2)	WD
6	Information technology — City data model — Part 3: Part 3: Service level concepts -Transportation planning (ISO/IEC WD 5087-3)	WD
6	Information Technology — Smart city — City service platform for public health emergency (ISO/IEC WD 5153)	WD
7	Guidance on smart city digital infrastructure design (ISO/IEC PWI 5217)	PWI

4.2.2 initiate potential projects:

- Task Force on Urban Operation System to explore potential opportunities for smart cities standard activities
- Task Force on pilot implementation programs and use cases study.
- Make ontology standards available on the web

Any ontology-based standard is to be made globally accessible on a server on the World Wide Web (WWW). The recommended WWW domain names are:

<http://ontology.iso.org>

.For example: <http://ontology.iso.org/21972.owl> is an example of its use for ISO/IEC 21972“Information technology - An upper level ontology for smart city indicators”

- Set up use case catalogue

This is a common catalogue, shared with IEC SyC Smart Cities and perhaps others (IEC SyC Smart Energy; ITU-T/SG20 Internet of Things), as a way of ensuring that the separate standard organizations cover all the requirements from the cities and work collaboratively rather than competitively.

- Piloting and testing

Setting up a task force on pilot implementations of standards (or combinations of standards) to address use cases.

4.2.3 Building relationships

- lunch of the JWG between WG 11 and IEC SyC Smart City, as the first step for a joint IEC-ISO-ITU Smart Cities Task Force in this area.
- Continue to talk with ISO/TC 268 Sustainable cities and communities, especially SC1 Smart community infrastructures,
- Explore collaboration with ITU-T, IEEE-SA, ETSI
- Talk within the JTC1 sub committees., as some established and recent JTC 1 work is of relevance to a smart city.
- Workshop on city data model
JTC 1/WG 11 will continually hold a series e-workshops on requirements for approaches to city data models for smart city.JTC 1/WG 11 members are encouraged to participate.

This could benefit from being coordinated, to better provide a consistent picture to the users in this wide-ranging market sector.

5 FUTURE MEETINGS

WG 11 will have one virtual plenary meeting on Dec 14-18, 2020.

WG 11 will have two face-to-face meetings in 2021. The first f2f meeting will be held in Japan on June 14-17,2021.