



Smart Cities 5.0

Digital Transformation through Disruptive Technologies & Standards

SyC Smart Cities – Virtual workshop

11:00 – 14:00 UTC on Friday, 17 July 2020

Register here:

https://iec.zoom.us/webinar/register/WN_vJAbCpFsRE-ek6B8EYNuaw

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1. About the workshop

Learn about the **Smart Cities 5.0 - Digital Transformation through Disruptive Technologies & Standards**.

Interested in learning how the development of national & international best practices and standards may support your efforts in sustainable transformation of your city's urban landscape?

IEC is hosting first global virtual workshop on the subject to disseminate the perspective of global thought leaders from the domains of disruptive technologies, digital transformation, standardization and smart cities. The global virtual workshop is being held as an integral part of the IEC Systems Committee (SyC) on Smart Cities meetings.

Leading national & international standardization and smart city experts are expected to attend from across 17+ nations including Australia, Austria, Canada, China, Germany, Japan, Korea, Mexico, Russia, Singapore, South Africa, Switzerland, United Kingdom and United States.

The workshop shall have eminent thought leaders from smart cities, digital transformation and disruptive technologies domains sharing their perspectives covering the cross-cutting topics around the disruptive technologies & standards interplay in context of smart cities (infrastructure) like – vision, strategy, standards; urban planning, infrastructure, sustainability, buildings and security; connectivity, digitalization, mobility, location & context modelling, interoperability and the environment. The workshop shall conclude with a live panel discussion providing some valuable actionable insights to the stakeholders of smart cities, disruptive technologies, digital transformation & standardization ecosystems.

The global virtual workshop will provide a great opportunity to understand how the systems approach can help scope out and design smart city initiatives and gain in-depth insights into the prospects and solutions offered by national & international smart city standardization work leveraging the latest disruptive technologies within the framework of UN Sustainable Development Goals.

2. Setting the context

A crisis as life-altering as the coronavirus pandemic naturally inspires speculation about how it will change everything. The impact it has had and continues to have on each and every aspect of our life is in fact beyond words. We may not yet know how this story ends, but we already know for sure that this pandemic has brought the greatest reversal of our times, turning the world along with its wisdom on its head... This is our freak chance to unlearn and learn. Let's not blow it.

This pandemic has catapulted two diametrically opposite paradigms to the focus of the mankind – **sustainability** and **digitalization**.

It has been observed that the technologies developed by human beings in the last 2-3 centuries have had a major impact on the earth's climate and our nature's equilibrium. Some believe that we have reached a point of no return. This can have a huge impact on the life on earth, especially on the human species. However, while technology has been responsible for most of it, technology also seems to have a solution for it.

The imperatives of building a sustainable and secure planet have given rise to new paradigms like the green movement, DC power, renewables, microgrids, sustainable transportation, networking devices, network & cyber security, smart homes, smart buildings, smart grids and smart cities. All these shifting and rising paradigms are ultimately converging into the new & much larger paradigm of **sustainable** and **trustworthy** digital infrastructure.

The extensive work done by various global SDOs has very comprehensively defined the frameworks & roadmap for future Information and Communications Technology (ICT) Infrastructure. However, the new paradigm of disruptive technologies like Internet of Things, big data, artificial intelligence, 5G and virtual/augmented/mixed reality has given rise to an entirely new aspect of the way human, machines and things are going to communicate with each other in the very near future. But true convergence is still eluding the evolved citizens of today's super industrial society, because of lack of harmonized standards in the respective ecosystems of smart homes, smart buildings, smart grid, and smart cities.

The multiplicity of technologies and their convergence in many new and emerging markets, however, particularly those involving large-scale infrastructure demand a top-down approach to standardization starting at the system or system-architecture rather than at the product level. Therefore, the systemic approach in standardization work can define and strengthen the systems approach throughout the technical community to ensure that highly complex market sectors can be properly addressed and supported. It promotes an increased co-operation with many other standards-developing organizations and relevant non-standards bodies needed on an international level.

Innovation and technology development are accelerating. Strategic plans and roadmap are needed to help ensure that the market is suitably served with best practices that is pertinent to the goals and context of this very large market?

Given the scale, moving forward through the labyrinth of disruptive technologies cannot be successfully, efficiently, and swiftly accomplished without standards. The role of standards to help steer and shape this journey is vital. Standards provide a foundation to support innovation. Standards capture tacit best practices and standards set regulatory compliance requirements, which is crucial for the sustainable digital transformation of the urban landscape.

The Standards support our need to balance agility, openness and security in a fast-moving environment. The Standards provide us with a reliable platform from which we are able to innovate, differentiate and scale up our technology development. They help us control essential security and integrate the right level of interoperability. Standards help ensure cyber security in ICT and IoT systems (Digital & Cyber Physical systems).

The respective ecosystems of smart infrastructure, smart manufacturing, health, education, banking, administration, governance etc today, require an unprecedented integration of systems across domains, hierarchic boundaries and life cycle phases. Systems Standards are needed for the automation and digitalization of our systems and solutions.

The world has never been as competitive as today, yet cooperation is a must to deliver solutions for increasingly complex systems. No technical committee and no standards organization are able to single handedly develop all the Standards that are needed. We all need to work together.

Global standardization landscape of smart cities is very fragmented. ISO, ITU, IEEE, many consortia, groups and companies are working in the smart cities domain. However, their works are fragmented and incompatible. Thus, none of them can individually address the complete domain comprehensively. Therefore, there is a need for orchestrating close collaboration, co-ordination and harmonization amongst the various on-going efforts.

This global virtual workshop is first of the series initiated by IEC Smart Cities Systems Committee to address such a homogeneous confluence of diverse, heterogeneous yet interdependent paradigms.

3. Agenda

IEC Systems Committee Smart Cities Global virtual workshop

Smart Cities 5.0 Digital Transformation through Disruptive Technologies & Standards

11:00 – 14:00 UTC on Friday, 17 July 2020

[Click here to register](#)

10:45 – 11:00	Login Time (Workshop will start 11:00 sharp)
11:00 – 11:05	Opening address <i>N. Kishor Narang, Vice Chair - Strategy IEC SyC Smart Cities</i>
11:05 – 11:20	An introduction to the IEC Smart Cities System Committee <i>Michel Mulquin, Chair - IEC SyC Smart Cities</i>
11:20 – 11:35	Design and develop smart city reference architecture in Japan <i>Kyoung-Sook Kim, AIST - Japan</i>
11:35 – 11:50	Location interoperability is an essential element in a smart city platform <i>Bart De Lathouwer, OGC</i>
11:50 – 12:05	Underlying concepts of smart cities and their implications <i>Eric Simmon, NIST - USA</i>
12:05 – 12:20	Introducing the OASC MIMs (Minimal Interoperability Mechanisms) <i>Gert De Tant, OASC</i>
12:20 – 12:35	Smart city & IoT architectures for scalability & interoperability <i>Joann O'Brien, TM Forum</i>
12:35 – 12:50	Context information modelling to create interoperable smart cities platforms <i>Stefano De Panfilis, FIWARE</i>
12:50 – 13:10	Systems approach to build smart cities <i>Alexander Samarin, IEC SyC Smart Cities</i>
13:10 – 13:45	Panel discussion <i>N. Kishor Narang, moderator</i> <i>Gennaro Ruggiero, Michael Mulquibn, Kyoung-Sook Kim, Bart De Lathouwer, Eric Simmon, Gert De Tant, Joann O'Brien, Stefano De Panfilis, Alexander Samarin</i>
13:45 – 14:00	Q&A + conclusion

Workshop Chair



Michael Mulquin
Chair, SyC Smart Cities

Workshop Curator



N. Kishor Narang
Vice Chair Strategy, SyC Smart Cities

Workshop Organizer



Gennaro Ruggiero
Secretary, SyC Smart Cities

4. Speakers' profiles:



N. Kishor Narang, *Mentor & Principal Design Architect, NARNIX TECHNOLOGICALS PVT. LTD. Technology Philanthropist, Innovation & Standardization Evangelist*

Kishor is Technology Consultant, Mentor & Design Architect in Electrical, Electronics & ICT with over 40 years of professional experience in education, research, design and consulting. Over 30 years of hardcore research and design development experience in solutions, systems, products, hardware, software & firmware (embedded software) in fields of industrial, power, IT, telecom, medical, energy and environment, and over 10 years of consultancy experience to different segments of business & industry. He has over 200 research & design mentees in the electronics, ICT & STI ecosystems. professionally, he is an Electronics Design Engineer practicing design & development of a wide spectrum of products, systems & solutions as an independent design house – NARNIX since 1981.

For last 10 years, deeply involved in standardization in the electrical, electronics, communication and information technology domains with focus on identifying gaps in standards to address interoperable systems & solutions deployments and bring harmonization by developing reference architectures for complex domains and defining standardized interfaces to ensure end-to-end interoperability. Leading standardization at national & global SDOs with main focus on digital transformation, disruptive technologies, 5G, security, trustworthiness and sustainability.

Gennaro Ruggiero, *Secretary, SyC Smart Cities*



Gennaro joined IEC in January 2017 where is responsible for the Systems Work, with the mission to bring systems approach and systems engineering methodologies in standardization. He is the Secretary for the Systems Committee “Smart Cities, Electrotechnical aspects”.

He holds a PhD in Physics and, prior joining IEC, he has worked in different research and industry sectors leading several programs to build complex instrumentation systems for space applications and for nuclear and high energy physics experiments. Gennaro has also been certified project management professional through PMI and certified systems engineering professional through INCOSE.



Michael Mulquin, *Chair, IEC SyC Smart Cities*

Michael has spent 25 years partnering with cities, rural areas, and industry on how technology can help neighborhoods and cities work better. For the last seven years he has been focusing on the development and implementation of smart and sustainable city standards and has had the opportunity to work with, and learn from, many experts in different standards development organizations.

He is technical author of two British Standards Institution publications: PD8100 Smart cities overview – Guide and PD8101 Smart cities – Guide to the role of the planning and development process. He is Chair of the IEC Smart Cities Systems Committee and is an active member of ISO TC 268 and JTC1 Working Group 11. He was a member of the ITU-T Smart and Sustainable Cities Focus Group. He is Principal Architect of the TM Forum's Smart City Maturity Model and continues to support their work on smart city standards. He received the TM Forum Outstanding Contributor Award in 2017. He is City Standards Associate with the Connected Places Catapult – the UK Government Innovation agency for smart transport and smart cities.

Title: *An introduction to the IEC Smart Cities System Committee*

Abstract: An introduction to the IEC Systems Committee on smart cities and our role in supporting the standards community in developing a consistent and coherent set of standards to enable cities to implement smart solutions to the challenges they face

Kyoung-Sook Kim, [AIST, Japan](#)

Kyoung-Sook Kim is the team leader of Data Platform Research Team at the Artificial Intelligence Research Center (AIRC) of AIST in Japan. I served as a researcher of National Institute of Information and Communications Technology in Japan from Nov. 2007 to Mar. 2014. I received my B.S., M.S., and Ph.D. Degrees in Computer Science from Pusan National University in Korea in 1998, 2001, and 2007, respectively. She currently serves a co-chair of Moving Features SWG and GeoAI DWG of the Open Geospatial Consortium (OGC) and an expert of ISO TC204/WG3 and JTC1 SC42/WG2. Her research interests are in Geo-enabled computing frameworks, Big data analysis, Spatiotemporal data platforms, etc.

Title: [Design and Develop Smart City Reference Architecture in Japan](#)

Abstract: Interoperability is an essential issue to realize smart cities in a national and global scale. Even though several cities have been building smart city infrastructures and systems in Japan, they are specialized in their city problems, and the resources of each smart city are silo. To accelerate the development of new systems of smart cities and ensure their interoperability, the Japanese government set up a national project of Cross-ministerial Strategic Innovation Promotion Program (SIP) called *Design the Smart City Reference Architecture*. The main objective of the architecture is to provide principle concepts and components, facilitate the service coordination within and between cities and horizontal deployment of results, and allow a playground to build a new system of smart city with the collaboration of different stakeholders such as private companies, local governments, and citizen.

Bart De Lathouwer, [OGC](#)

Bart is OGC's President. In this role, he manages the consortium, provides oversight and direction to the Consortium's strategy, budget, outreach & marketing, and membership recruitment goals, in close collaboration with the CEO. Bart also continues to be the General Manager for OGC Europe. Previous roles at OGC, include responsibility for planning and managing Innovation Initiatives with an emphasis on activities in Europe. Previous to his time at OGC, Bart worked first as European liaison to the geospatial division of Autodesk and later as Autodesk's Product Manager for Server Technologies. In this role, he also served as a member company representative to the OGC.

Title: [Location interoperability is an essential element in a Smart City Platform](#)

Abstract: This talk traces the evolution from static point-in-time digital twins based on city models and BIM, to dynamic digital twins that update at high resolution in near real time, thanks to ubiquitous sensor feeds and large-scale predictive modelling. It shows that interoperability (through standards) of location and place (i.e. physical and social geography) is the glue that connects these dynamic 3D models to real improvements in the quality of urban life.

Eric Simmon, [NIST, USA](#)

Eric Simmon is a scientist in the Cyber Infrastructure Group at the National Institute of Standards of Technology. He started working for NIST in 1989 researching precision measurements for high voltage and high current and in 2003 moved to researching information standards for complex systems. Mr. Simmon has worked on standards for a variety of industries including; the electronics supply chain, smart grid, cloud computing, and IoT. He is currently leading NIST efforts on cyber-physical cloud computing, IoT architecture, composition, and interoperability and is working on many international standards activities for IoT. He chairs the Industrial Internet Architecture Task Group and is an active participant on several ISO/IEC committees including SC41 (Internet of Things), SC38 (Cloud Computing and Distributed Platforms) and AG8 (Meta Reference Architecture and Reference Architecture for Systems Integration).

Title: *Underlying concepts of Smart Cities and their implications*

Abstract: This presentation will cover underlying technologies enabling smart cities including; Internet of Things, distributed computing, networking, sensing and actuating, system of systems. The presentation will provide insight into these technologies and how they impact standards and reference architectures for

Gert De Tant, *OASC*



Gert is the CTO of OASC (oascities.org) and the CEO of Sirius (sirius.be). His focus is on the architecture and implementation of data driven platforms for cities, that enable cities to innovate and provide better and more advanced services to their clients being citizens, visitors and companies. He has worked for a number of cities in Europe like Antwerp, Ghent, Luxembourg and Paderborn and was part of several European projects like Synchronicity and Select 4 Cities. Next to that he is part of the TTF of ETSI to help evaluate the NGSI-LD standard.

Title: *Introducing the OASC MIMs (Minimal Interoperability Mechanisms)*

Abstract: This talk introduces the MIMs and illustrates how they are implemented and their benefits. How the OASC MIMs help to create a single digital market for city services. OASC is a global network of 150 cities from 30 countries with the goal to shape and create a market for smart city data and services. To enable this OASC is promoting the use of open and Minimal Interoperability Mechanisms (MIMs) which are decided and agreed upon by the cities.

Joann O'Brien, *Vice President, Digital Ecosystems, TM Forum*



Joann currently leads the Digital Ecosystem initiatives at TM Forum, leading TM Forum's strategic initiative for business growth beyond connectivity. She is a transformative technology leader who recognizes the importance of APIs, 5G, IoT and automation in achieving a true digital strategy. Joann led the TM Forum's Open API initiative from concept to global success as an enabler to the zero-integration economy and has significant experience leading complex large-scale transformation programs for a number of global organizations, including healthcare, manufacturing, telecommunications and smart cities. The Digital Ecosystem program is designed to accelerate member companies' ability to design, plan, operationalize and assure new market opportunities through insights, practices and tangible assets enabling a structured, scalable approach to commercializing new services. Joann holds a BSc in Information Technology majoring in Telecommunications from Dublin City University and MBA from Open University.

Title: *Smart City & IoT Architectures for scalability & interoperability*

Abstract: This presentation will show how IoT architectures and common TM Forum Open APIs can enable interoperability and scalability, accelerating new product introduction and scaling up existing services. TM Forum has led the way in building pragmatic tools to enable adopting an IoT strategy. The first of these is a suite of Open APIs for IoT Device Management, collaboratively developed by members from Axiata, Vodafone and IoT Labs. This suite helps service providers to manage IoT devices throughout their lifecycle while speeding up prototyping and commercial deployments. This means providers can rapidly expand their IoT offerings into vertical markets by building upon a common reusable infrastructural layer.

Stefano De Panfilis, *FIWARE*



Since July 2016 he holds the COO position within the FIWARE Foundation where he effectively moved starting 1st January 2017. Since 1993, he supported Engineering to receive the ISO-9001 compliance certificate and he is currently involved in the CMM assessment process. In April 1994, he started his involvement in European Union funded R&D projects where in coordinated several of them. In 2004 he became the Director of the R&D Department leading a team of about 100 researchers in Italy and Europe. He actively participated from its beginning to the creation and setting up of the NESSI ETP of which he was the Technical Director and the Coordinator of the Strategic Research Agenda Committee till spring 2010. In June 2011 he became the Chief Innovation Officer of the Engineering Group.

He actively participated in the Future Internet various initiatives set-up by the European Commission having also served the Future Internet Assembly (FIA) caretakers committee for several FIA editions. In this context he was one of the founders of the Future Internet Public Private Partnership (FI-PPP) now known as the FIWARE initiative. Since the FI-WARE project he is the responsible of FIWARE Lab and from April 2012 till its end, he was a member in the FI-PPP Architecture Board. In 2013 he was elected Chairman of the FI-PPP Steering Board. Author of several scientific papers appeared in international journals and in conferences proceedings, he is member of a number of international conferences Program Committees.

Title: *Context information modelling to create interoperable smart cities platforms*

Abstract: The talk presents Context Information Modelling as a key technology for a) building smart application with a particular emphasis on smart cities, b) breaking silos among different existing systems and how to make them interoperable, c) related standardization efforts, and finally d) adoption cases. The talk is in the context of FIWARE and its achievements.

Dr Alexander SAMARIN, (*affiliation SAMARIN.BIZ*)



Since the year 1979, Alexander Samarin worked with digital transformation projects at different scale: company, corporation, canton, city, county, confederation and continent. He has served for a variety of international clients in Switzerland, UK, France, Australia and Africa. Based on his diverse experience in many domains and being the author of two books, now he acts as a methodologist, architect and practitioner for digital transformation of socio-technological systems.

Title: *Systems approach to build Smart Cities*

Abstract: This talk is about the Systemic digital transformation of cities into Smart Cities. Smart Cities is one of the essential endeavors right now. Each city is different, however, Smart Cities have many things in common. Sustainable digital transformation of thousand cities into Smart Cities is a systemic problem. The IEC systems approach has been developed and applied to address such uber-complex systemic problems. Thus, Smart City is a city built as a digitally coordinated system to integrate and combine by design various views on the city for better life of its citizens, easier doing of business and sustainable improvements.

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