



IEC ACADEMY WEBINAR Q&A

Virtual Workshop: Smart Cities 5.0 - Digital Transformation through Disruptive Technologies & Standards, 17 July 2020

Questions	Answers
<p>Are the standards and technical reference architecture that Michael Mulquin mentioned available and if so, how can we access them?</p>	<p>Today most of the work presented by Michael Mulquin, SyC Smart Cities Chair, is in draft form, which means it is accessible from the SyC Smart Cities webpage (go to “Projects/Publications” tab & select the project you are interested in). Please note that you can still participate and contribute to its development by contacting your IEC National Committee (https://www.iec.ch/dyn/www/f?p=103:5:0) to become an expert of the SyC Smart Cities.</p> <p>Standards already published can be purchased on https://webstore.iec.ch/</p>
<p>You seem to have decided that the city is the single most important unit of abstraction for thinking about systems and infrastructure. Whilst there is merit in that it is not the only vision of society. As someone who does not live in a city I often find great difficulty with using systems based around cities. An example would be transport, travelling to a city from outside, parking for people who have to visit from rural areas and so on. How might you think about softening the boundaries of city systems to better facilitate their use by people who do not live IN the city, and are often excluded?</p>	<p>In our context “Cities” refers to any geographically located population. This means that we place no upper or lower limits on the size of the smart human settlement. It also means that we do not draw any rigid boundaries around a city because we realise that many people that use the city for work, shopping or entertainment come in from the surrounding area. Also, many goods and utilities that are consumed in the city come from outside the city.</p> <p>For this reason, we try to consider the city in our work in this wider sense. For instance, in the reference architecture, people working in a city or visiting the city are included among the primary beneficiaries of the city as a system.</p> <p>However, this is an important point and we need to continue to remind ourselves of these issues in our work. Although in this webinar we focused on smart cities, our work does take into account issues of rural areas (there are some good initiatives relating to this aspect, for instance for smart villages). Indeed, smart cities and smart villages share some common aspects and should be handled in a complementary manner.</p>
<p>How is the IEC Smart Cities modelling, as presented by Michael Mulquin, relevant or adaptable to mega-cities in the developing or under-developed world? These cities are struggling to simply bring adequate services, let alone 'smart' services.</p>	<p>The aim of our work is not to get cities to implement smart solutions, but rather to help them identify any smart solutions that would help with their specific requirements. Many cities in the developing or underdeveloped world are using low cost but very effective technology solutions to help meet the challenges they face.</p> <p>More generally, it is true that there are different kinds of cities and some standards are more appropriate for some and not for others. One aspect of the work we have just undertaken is to find a way of identifying the main types of city and their different requirements in a way that will allow us, in the standards' community, to provide more tailored solutions.</p>
<p>Did the serious disruptions to electricity supply after the nuclear shut down in Japan have a major societal and business impact?</p>	<p>Actually, the impact of the disruptions was not a big issue, but we were starting to seriously consider cloud computing and communication infrastructures for the sustainable society and business model.</p>

<p>Is the Smart City Reference Architecture of Japan available for share?</p>	<p>Yes. You can access the details of the architecture in English at: https://www8.cao.go.jp/cstp/stmain/a-whitepaper1_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-whitepaper2_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-whitepaper3_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-whitepaper4_200331_en.pdf</p> <p>And guidance on how to use SCRA into the implementation. https://www8.cao.go.jp/cstp/stmain/a-guidebook1_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-guidebook2_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-guidebook3_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-guidebook4_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-guidebook5_200331_en.pdf https://www8.cao.go.jp/cstp/stmain/a-guidebook6_200331_en.pdf</p>
<p>Standards for smart cities need to be developed and linked to the Performance Indicators, such as improved service delivery to attain a certain level of quality. What could be the key performance indicator in terms of economy and environment?</p>	<p>There are several ways to measure the effectiveness of smart city initiatives in general, and that of the way standards can help in particular.</p> <p>The new edition of ISO 37106 contains a Benefit Realisation Framework that ensures a clear line of sight between actions and vision, and that the intended benefits from the smart city programme are delivered in practice. The framework is built around the three pillars of benefit mapping, benefit tracking, and benefit delivery.</p> <p>ISO 37107 provides a Maturity model for smart sustainable communities that allows cities to assess progress in a structured and objective way towards achieving sustainable outcomes. This includes guidance regarding the assessment of performance related to the economy and the environment.</p> <p>In terms of KPIs ISO 37120 <i>Sustainable cities and communities — Indicators for city services and quality of life</i>, and ISO 37122 <i>Smart City Indicators</i> both contain indicators related to the economy and the environment. The ITU supported U4SSC initiative has a set of indicators to capture a city's performance in three dimensions: economy, environment & society and culture.</p> <p>It is difficult to identify a single Key Performance Indicator relating to the economy or to the environment as both depend on the specific challenges and opportunities that individual cities face.</p>
<p>How would you adapt this Japanese model to cities which may be facing resource constraints, for example in under-developed economies? Does this mean that this model assumes that there are abundant financial resources for all services and developing 'smart' ideas?</p>	<p>I do not think the architecture assumes full resources. That is why we divide into several components and try to make it extensible.</p>
<p>From the presentation I see a very strong need for an ethics code; there is so much power that can be made available to so few.</p>	<p>There is indeed a great need for an ethical approach. This is where standards can help - first, because standards-based solutions are developed in an open and transparent way and so it is much easier to understand the implications than a proprietary solution. Secondly, Standards Development Organizations (SDOs) are looking at the ethical implications of all these complex solutions and developing standards that can help the ethical issues to be managed effectively.</p>
<p>How to establish interoperability and set up standards for devices and solutions?</p>	<p>Interoperability is one of the key challenges that standards organizations are working on. This is where a systems approach can help. Some national standards organizations, for example BIS LITD 28 in India, are undertaking very useful work in this area, and the Global SDOs will be able to build on these.</p>

<p>What revenue generation opportunities exist from deploying a Smart City OS? How can cities make money by investing in city wide platforms?</p> <p>When it comes to City OS/Platforms that the panel spoke about, are there any monetization opportunities for cities that are investing in them?</p>	<p>There are many opportunities for monetization based on data available through the City OS (Open Source)/Platforms from services that can be generated.</p> <p>The TM Forum and Fiware are working together on developing APIs (Application Programming Interface) that will support the monetization of data on a city platform.</p>
<p>How does the smart city system architecture intend to include requirements to handle pandemic like Covid-19?</p>	<p>Several of the International Standards Organizations are starting work on this. In the IEC Smart Cities Systems Committee, we are working with all of them and trying to help by analysing all the different types of actions needed and identifying all the requirements of such a platform. In this way we can make sure that our work on the architecture properly captures any requirements coming out of this, as well as ensuring that the specialist Standards Development Organizations develop standards in their field of expertise that are consistent with those developed by other SDOs</p>
<p>Congratulations for this well designed and rich webinar! To “building back better “after the COVID-19 crash test, Resiliency is a new urgent need beyond Sustainability. Resiliency is currently used as a buzz word, but it has a specific meaning and value. ISO has developed catalogues of specific indicators for Resilient cities: (ISO 37123, Sustainable cities and communities – Indicators for resilient cities). The System Committee Smart Cities has just published a relevant and timely SMART CITIES SERVICE CONTINUITY (IEC 63152), but more generally is Resiliency going to be addressed systematically from now on across all deliverables ?</p>	<p>Thank you for your encouraging feedback.</p> <p>Resilience is an issue that is of growing importance to cities. In the IEC we are developing further guidance on the implementation of IEC 63512 and Resilience is one of the cross-cutting aspects of the Smart City Reference Architecture we are working on.</p> <p>Specifically, a standards proposal on <i>Use Case Collection and Analysis Public Health Emergencies in Smart Cities</i> is now out for voting.</p> <p>The British Standards Institution (BSI) has published BS 67000:2019 <i>City resilience. Guide</i> which provides a lot of practical guidance that has a much wider relevance than for the UK.</p> <p>ISO TC292 is in the process of developing ISO/AWI 22371 <i>Security and resilience – Urban resilience - Framework, model and guidelines for strategy and implementation</i></p> <p>In line with the other SDOs, the IEC has recently begun requiring all new proposals for standards work to demonstrate their relevance to the UN Sustainable Development Goals. It may well make sense to extend this to cover resilience.</p>
<p>We have parallel Standards activities from IEEE, IEC, ISO, etc. How can we unify these efforts to win some time because the technology is moving much faster than standards?</p>	<p>This is the big challenge! ISO, IEC and ITU-T have set up a Joint Task force for smart cities to foster a coordinated and inclusive approach for standardization in the domain. The first meeting was planned to take place in April, but the pandemic stopped this. It is now planned for early October 2020, and that will greatly help with coordination and therefore with the speed of standards development.</p> <p>Once it is up and running, it would be great to include the other key Standards organizations such as IEEE.</p>
<p>With the plethora of standards and work in progress around standards, is there a practical approach for cities to adopt standards so they do not end up in a complicated situation down the road?</p>	<p>One thing that will help is the IEC SyC Smart Cities work on developing a Reference Architecture to provide cities with a systematic and common way of describing their structure and processes and of understanding the relationship between the different systems and domains. We are also working at mapping all standards related to smart cities to this reference architecture, which will allow cities to make better choices about the standards they use.</p> <p>A longer-term solution is the ISO/IEC/ITU-T Joint Smart Cities Task Force. It is likely that an early focus of work will be to develop a common smart cities framework and road map, which will allow us to better identify which SDO should work on which standard in the future and to ensure that these standards integrate well together.</p>

<p>How do Smart Cities address economic disparities in particular as regards to access to the technology required by inhabitants to interact with a new grid of systems?</p>	<p>Of course, the challenge is not just economic disparities, but also skill disparities. What is important is that cities do not only focus on the technologies and solutions that will make the lives of city administrators easier. The role of city administrations is to improve the lives of all their citizens, both now and in the future. So they need to focus on solutions that address the real needs of all their citizens and, in the standards world, we need to give them the tools that allow them to do that.</p>
<p>Which technology for communications is recommended for Smart Cities until 5G is available?</p>	<p>Several technologies are available depending on the specific use case, LoRa, Low Energy Bluetooth, Narrow Band IoT, LTE-M and so on, so there is no simple answer to this question. 5G will have many applications but is not the ultimate solution. There will always be multiple technologies in play based on each use case. Even in the 5G Era, for the Backhaul FIBRE is going to be the real enabler, so investment in fibre will always make sense.</p>
<p>To what extent does the physical planning of a new city impact the implementation of smart city technologies?</p>	<p>City planners (ISOCARP) are very active in Smart City initiatives (e.g. ESPRESSO http://espresso-project.eu/) making sure that the technologies fit in the city planning.</p> <p>In our IEC Smart Cities Systems Committee, we are just starting work on <i>Use Case Collection and Analysis Urban Planning in Smart Cities</i> and we would welcome wider involvement.</p> <p>You could also look at British Standards Institution's PD8101 <i>Smart Cities: guide on the role of the planning and development process</i>.</p>
<p>How is the environmental aspect taken into consideration apart from the technology?</p>	<p>IEC, ISO and ITU-T now ensure that all our standards work addresses Sustainability through using the UN Sustainable Development Goals (SDGs) as a way of focusing our efforts.</p>
<p>We have ended up fixing security - bolt on - with computing and sensors as after the thought. How far is it wise to start using AI for value (insight & effectiveness) without appreciating the inherent bias and predispositions?</p>	<p>Without understanding how AI (Artificial Intelligence) bias may affect smart city services then it is very difficult to have confidence in those services. The challenge is that we need to start using AI in order to understand better what the issues are.</p> <p>We therefore cannot simply stop using AI until we have first sorted out all the issues of bias and predispositions. However we need to move carefully in this area and make sure that we continually review the AI applications we are developing.</p> <p>If you are interested in finding out more, ISO/IEC JTC1 SG42 is working on ISO/IEC AWI TR 24027 Information technology — Artificial Intelligence (AI) — Bias in AI systems and AI aided decision making</p> <p>This is definitely an area where we need to improve our understanding.</p>
<p>What are communication technology requirements for smart cities in 2021?</p>	<p>Both ITU-T Study Group 20 and JTC1 WG11 are in the process of providing guidance documents regarding this.</p> <p>A good basic summary, which still has a lot of useful information even though it is seven years old, is the JTC1 smart cities report https://www.iso.org/files/live/sites/isoorg/files/developing_standards/docs/en/smart_cities_report-jtc1.pdf</p>
<p>In your opinion what should regulatory authorities focus on when regulating the implementation of smart cities, specifically when it comes to spectrum related issues?</p>	<p>Clearly the fundamental issue that cities need to focus on is how to provide benefit to their citizens keeping in mind forgetting inclusiveness and also the balance between community benefit and individual privacy, i.e. smart cities shall be for all, still respecting all.</p> <ul style="list-style-type: none"> • Correct balance between unlicensed and licenced spectrum in a way that allows low cost-of-entry to small, innovative companies to have spectrum that they can use to pilot and deliver new services while ensuring that the large communication providers can have reliable access to spectrum at a fair price to deliver their services • Radiation level concerns on citizen health <p>For more details, the specialist standards bodies are ITU-T and ISO/IEC JTC 1.</p>
<p>Why maximum LV switchgear IEC standards start from 6 example: IEC 60947 and why there are only 5 digits?</p>	<p>All IEC standards start with 6 and have 5 digits.</p>

<p>What level of DC microgrids in Buildings is used within the Smart City?</p>	<p>We know that a number of cities are piloting DC microgrids in buildings, but this is not an area where we have any involvement as yet. Within the IEC the relevant committees are SEG 9, SyC LVDC, SC 8B and TC 64.</p>
<p>Cities are different and we need “Horses for Courses”. Is the trick a flexible Standards Framework?</p>	<p>You are right, cities are different and have different visions. Our approach is to have a minimal set of standards and let cities and communities decide their further enhancements which are needed for their city.</p>
<p>Do you know what are the standards dealing with interoperability requirements of video cameras for surveillance and citizen security purposes?</p>	<p>This is clearly a key issue, but a detailed one. As a Systems Committee we still largely have an overview of the technical standards, although we are beginning work on cataloguing relevant standards for smart cities. There are many Standards committees working in this area, for instance IEC/TC 100 and IEC/ISO JTC1/SC 25.</p> <p>If you would like to know more, please contact michael@iscommunications.co.uk with more detailed questions.</p>
<p>We support the regulator in citizen security. What are the standards we should look at to establish the requirements in this domain?</p>	<p>There are many different aspects of citizen security and it is difficult to provide a clear answer without understanding the specifics of your requirements. Please contact michael@iscommunications.co.uk so that we can provide a tailored response.</p>
<p>How do we get Government departments out of 'Siloed Thinking' mode?</p>	<p>Silos are an important part of managing a city and a country, because specialist departments with specialist expertise and focus are needed to make things work. The problem comes when those silos remain isolated from each other, with different aspects of citizens' lives being managed separately, with no understanding of the impact that each of them has on the other. Cities need a systems approach to delivering what their citizens need.</p> <p>The two key steps are first to have a strong focus on making life easier for the citizen, and secondly to use the power of data, and data sharing to enable the silos to be managed holistically.</p> <p>A helpful guide is ISO 37106: <i>Guidance on establishing smart city operating models for sustainable communities</i>. This provides “a toolkit of “smart practices” for managing governance, services, data and systems across the city in an open, collaborative, citizen-centric and digitally-enabled way.”</p> <p>Of course, once the city administration is out of the 'Siloed Thinking' mode, a whole range of standards are needed to help them implement this integrated approach, and this is why the IEC SyC Smart Cities is working on the Reference Architecture, and on the Use Case Collection and Analysis series of Systems Reference Deliverables.</p>
<p>What is the difference between a “Reference Architecture” and a “Value creation framework”?</p>	<p>A value creation framework is an important tool to help structure the ecosystem of departments, companies and organizations needed to deliver significant value in a way that ensures that each organization playing a role in that ecosystem will gain the required value necessary to ensure its full participation and that the value created can be maximised.</p> <p>A Reference Architecture takes several steps back from this. It also takes a complex system as its focus, but its aim is to understand and describe all the many issues that need to be addressed for the ecosystem to work. It covers strategy, management, financing, product development, security, processes, hardware and software, etc. Only once all of these issues have been identified, described and their relationships detailed, is it possible to comprehensively understand that ecosystem and all the different roles and responsibilities that are needed and the requirements that need to be met for that ecosystem to deliver on its objectives.</p> <p>A Reference Architecture is therefore a solid foundation that allows a value creation framework to be developed, one that takes into account all the requirements of the ecosystem, the organizations that are needed to meet those requirements and that identifies how each of them can obtain the value that they are looking for.</p>

<p>How does blockchain relate to smart cities?</p>	<p>There are many possible applications in the context of smart cities. Some cities are investigating using Blockchain to support a local city currency as legal tender. Also, all public registers may be implemented on blockchain to provide additional transparency and security.</p> <p>These are still early days and different cities are testing its use out in a variety of scenarios.</p> <p>One example is the TOKEN project, which is supporting experimentation in the context of public administrations in a number of different smart cities. www.token-project.eu</p>
<p>Do you consider an ethics index (ethics classification) as a general evaluation for IoT devices and/or systems? This would be very helpful to push ethical systems forward.</p>	<p>Ethics is vitally important for managing the use of IoT (Internet of Things) devices but needs to cover the whole system of which the IoT is a part – including, for instance, data analytics, facial recognition software, AI and so on. There is a lot of standardization work ongoing in this area, including in IEC SEG 10, IEC/ISO JTC1/SC42, IEEE P7000 series, and OCEANIS. A wider systematic approach including developing frameworks and an Ethics index may well be the next step. Thank you for the suggestion.</p>
<p>Can you give a brief explanation from Smart Cities 1.0 to 5.0?</p>	<p>The background to the use of Smart Cities 5.0 in the title of the workshop is that the speakers in the workshop came together in a two-day event in Tokyo back in January to consider a Smart City Reference Architecture in the context of Japan's focus on the concept of Society 5.0. This is Japan's response to Industry 4.0, which describes how industry is becoming increasingly automated, with extensive use of IoT, robotics and AI. While the Japanese government is fully behind this move, it decided to place it in a wider context of seeing how this increasing automation needs to be fully integrated into society as a whole, with human beings and all of our social interactions and relationships at the centre. The Japanese government has placed its work on Smart Cities firmly within this context as "super smart cities 5.0" and we found this a very helpful perspective.</p>