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| **Keywords:** | CxO group meeting communiqué |
| **Abstract:** | This TD provides the communiqués of the TSB Director CxO meetings, 24 September 2017, Busan, Republic of Korea, and of 7 December 2017, Dubai, United Arab Emirates. |

**Action**: TSAG RG-StdsStrat is invited to consider this document.

A TSB Director CxO meeting took place 7 December 2017, Dubai, United Arab Emirates. The published Communiqué is attached and is also available at

<https://www.itu.int/en/ITU-T/tsbdir/CxO/Documents/CxO_Communique_7Dec.pdf>

The 9th TSB Director CTO meeting took place 24 September 2017, Busan, Republic of Korea. The published Communiqué is attached and is also available at

<http://www.itu.int/en/ITU-T/tsbdir/cto/Documents/final_communique.pdf>

**Attachments: 2**

* TSB Director CxO meeting, 7 December 2017, Dubai, United Arab Emirates, Communiqué
* TSB Director CTO meeting, 24 September 2017, Busan, Republic of Korea, Communiqué.

**TSB Director CxO meeting**

**7 December 2017, Dubai, United Arab Emirates**

**Communiqué**

The transformative role to be played by artificial intelligence (AI) and 5G systems – in telecommunications, smart sustainable cities and society at large – was in focus at a meeting of 18 high-level ICT executives (CxOs) and the senior management of the ITU Telecommunication Standardization Sector (ITU-T).

The CxO meeting took place alongside the Telecom Review Summit 2017 in Dubai, UAE. The Arab region was especially well represented at the CxO meeting, a meeting which provided industry leaders with an opportunity to exchange views with ITU on emerging industry needs and related standardization priorities.

**“Operator in a box” – key principles enabling smart city innovation and efficient service delivery**

Attendees discussed how information and communication technologies (ICTs) will assist the response to challenges associated with globalization, changing climates and demographics and aging infrastructure, as well as enhance the quality of public services and create business environments supportive of growth and innovation. The meeting highlighted the opportunity for network operators to enable the shift towards a smarter society by building efficient, interoperable, reliable, scalable, secure ICT platforms.

Participants called on ITU to consider the following as key principles of standardization work to enable this transformation:

* *Security and privacy by design,* considering security and privacy from the outset of ICT services’ development through to the proactive monitoring and protection of live services
* *open APIs*, enabling third parties to access and build on network capabilities to develop innovative, reusable services
* *network virtualization,* capitalizing on techniques including network function virtualization (NFV) and software-defined networking (SDN) to support services in demand of low latency and high efficiency and flexibility
* *Identity and authorization,* providing for the reliable identification essential to secure, efficient service provision
* *Analytics*, supporting the development of evidence-based, data driven services
* *Accessibility by design,* mainstreaming the consideration of needs of the elderly and persons with disabilities to build inclusive ICT solutions.

**Realizing the 5G vision**

CxOs described future 5G systems as representative of a technological shift empowering a wide range of use cases over and above smart cities and industry digitalization. Participants recognized that 5G development is well underway in R&D labs and standards bodies – including ITU-T Study Groups 2, 5, 11, 13 and 15 – but highlighted a range of hurdles still to be overcome before 5G systems can be deployed, including spectrum availability and harmonization; a unified 5G network architecture allowing for flexibility, automation and fixed-mobile convergence; large-bandwidth backhaul and fronthaul solutions; and concrete strategies for the migration from 4G to 5G systems.

To realize the 5G vision and meet the set timeline, participants argued that operators, vendors, regulators and standards bodies should adopt a strong spirit of cooperation, innovation and change.

CxOs identified a range of 5G-relevant standardization areas in need of further attention, areas such as end-to-end network orchestration, control and management; service-based network architecture; open service management APIs for the Internet of Things; electromagnetic field (EMF) studies around 5G beam-forming capabilities; and the interoperability of services supporting public safety.

Operators and vendors present at the meeting called for concerted effort by ITU-T Study Groups and other organizations active in the field of 5G to address open issues and accelerate standards development, thereby reducing the uncertainty created by a proliferation of options and promoting multi-vendor interoperability.

Participants highlighted the value of ITU as a neutral platform for 5G standards development and coordination, as well as the opportunity to leverage the work of open-source communities to complement formal standards.

**Artificial intelligence and machine learning – silver bullet?**

Silver bullet? Not yet, agreed CxOs. The meeting categorized AI-driven services and network-management scenarios – including customer behavior analysis; dynamic network-resource provisioning and optimization; and predictive network maintenance – as either *intra*-network or *inter*-network use cases, the latter requiring interface standards for control and negotiation. Participants welcomed the work of the ITU Focus Group on ‘Machine learning for Future Networks including 5G’ to develop technical specifications and reports on the required interfaces, network architectures, protocols, algorithms and data formats. Novel approaches to the performance benchmarking and certification of AI techniques were considered by CxOs to be in need of further attention.

**Briefing on recent ITU achievements and call for ENUM input**

CxOs appreciated the opportunity to learn about ITU initiatives relevant to the topics discussed at the meeting, initiatives such as the AI for Global Good Summit and ITU work on data processing and management, distributed ledger technologies, digital financial inclusion and digital fiat currency.

ITU representatives brought CxOs’ attention to the importance of ITU’s work on VoLTE/ViLTE interconnection, highlighting in addition that the slow adoption of ENUM – a key component of IMS interconnection – poses a technical barrier to global VoLTE/ViLTE interconnection.

The Rapporteur on ITU-T standardization strategy introduced examples of how recommendations issued by past CxO and CTO meetings had given rise to new ITU-T standardization activities.

The CxO meeting’s participants expressed their gratitude to ITU-T for the opportunity to exchange views on emerging trends and associated standardization priorities.

Chaesub Lee, the Director of the ITU Telecommunication Standardization Bureau, expressed his appreciation to Trace Media for hosting the meeting and invited all participants to join the next CTO meeting scheduled for 9 September 2018 in Durban, South Africa, as part of ITU Telecom World 2018.

The meeting welcomed an invitation from Saudi Arabia’s Communications and Information Technology Commission (CITC) to host the next CxO Meeting in Saudi Arabia in 2018 (dates and location to be confirmed).

**The participating organizations were:**

**Arab ICT Organization**, Tunisia; **China Mobile**, China; **Communications and Information Technology Commission**, Saudi Arabia; **DarkMatter**, United Arab Emirates; **Emirates Integrated Telecommunication Company (du)**, United Arab Emirates; **Ericsson**, Sweden; **Fujitsu**, Japan; **Huawei Technologies**, China; **NEC**, Japan; **Nokia**, Finland; **NXN**, United Arab Emirates; **Sofrecom**, France; **Telecom Review North America**, United States; **Telecommunications Regulatory Authority**, United Arab Emirates; **Telecommunication Technology Committee**, Japan; **TELUS**, Canada; **TODA-Algorand**, United States; **Trace Media**, United Arab Emirates; **ITU**.

**TSB Director CTO meeting**

**24 September 2017, Busan, Republic of Korea**

**Communiqué**

High-level ICT industry executives (CTOs) have highlighted the strategic importance of international standardization’s support for the evolution of global telecommunications networks and the contribution of artificial intelligence (AI) to the reduction of operational expenditure and the improvement of the use and maintenance of networks.

CTOs met with the senior management of the ITU Telecommunication Standardization Sector (ITU-T) at the ninth annual CTO Meeting in Busan, Korea, at ITU Telecom World 2017. The meeting provided the leadership of ITU-T Sector Members with an opportunity to exchange views with the Telecommunication Standardization Bureau (TSB) on industry needs and related standardization priorities. The meeting was also attended by the Director of the ITU Radio Bureau.

**Intelligence for network automation, augmentation and amplification**

Participants examined emerging scenarios enabled by machine learning and AI methods, tools and techniques to create data-driven, intelligent, robust and secure systems. In the context of future 5G systems, such methods will allow for a better understanding of the behavior of both users and the network, enabling the optimization of the use of scarce radio resources and the prediction of related decisions’ impacts over time. Automatic detection and resolution of anomalies and other incidents of inefficiency, as well as predictive maintenance, will contribute to a reduction of the operational expenditure of network operators, as well as service providers in other sectors. The meeting also learned how some operators offer AI-enabled services as a unique selling proposition to their subscribers.

The meeting called for further studies in ITU to identify and better understand the standardization needs for intelligence in 5G systems and the telecommunications sector. These studies should start with a review of AI-related definitions and terminology; cover an analysis of existing and emerging standards and specifications in this domain; and further address the architecture, interfaces, functional entities, service scenarios and protocols required for intelligence retrieval and actuation.

**Convergence calls for flexible networking solutions**

CTOs expressed the view that the use of intelligence and virtualization techniques at the network edge constitutes yet more evidence of the convergence of IT and telecommunications sectors.

ITU has been successful in building a widely recognized technological leadership in transport networks, which has been beneficial for the telecommunications industry as a whole and should be maintained as a common asset. Convergence, and the entrance of fast-growing OTT players and other industry sectors to the ICT ecosystem, yields a new set of requirements to be met through common flexible, programmable and scalable networking solutions.

CTOs called for ITU-T standardization work to take these new requirements into consideration, addressing short-distance, large-bandwidth and low-cost data center interconnection, edge cloud inter-networking, and emerging fronthaul and midhaul technologies to support the deployment of 5G systems.

Participants recommended to ITU-T to engage with OTT and vertical sector organizations to identify, understand and respond to their networking requirements in a timely and accurate manner. They invited Google, Facebook and other interested parties to submit technical contributions on data center interconnection to ITU-T Study Group 15, ITU’s lead group on transport networks. The meeting highlighted the need for ITU-T to build synergies with other SDOs and open source communities to enable seamless connectivity across fixed and mobile networks.

**Next steps**

The Rapporteur on ITU-T standardization strategy thanked attendees of the CTO meeting for their valuable guidance and gave examples of how recommendations made by past CTO meetings had given rise to new ITU-T standardization activities.

The CTO meeting’s participants expressed their gratitude to ITU-T and ITU-R for the opportunity to exchange views on standardization priorities.

Chaesub Lee, the Director of the ITU Telecommunication Standardization Bureau, extended an invitation to CTOs to participate in a meeting of C-level executives of ICT companies and invited guests representing other industry sectors, scheduled for 7 December 2017 in Dubai, UAE, kindly hosted by Trace Media.

**The participating organizations were:**

**Ericsson**, Sweden; **ETRI**, Korea (Rep. of); **Fujitsu**, Japan; **Hewlett Packard Enterprise**, United States; **Huawei Technologies**, China; **KDDI**, Japan; **KT**, Korea (Rep. of); **NEC**, Japan; **NICT**, Japan; **Nokia**, Finland; **Orange**, France; **Samsung Electronics**, Korea (Rep. of); **Telkom**, Indonesia; **Trace Media**, United Arab Emirates; **TTC**, Japan; **Tunisie Telecom**, Tunisia; **ITU** (TSB and BR).

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