European Technology Platform NetWorld2020

Workshop on 5G for Smart Manufacturing

POST-EVENT REPORT

January 28, 2021

Event Overview

- **Location:** Virtual Attendance
- **Date:** 28/01/201
- **Duration**: 3 hours
- **Number of registrations:** 110
- **Maximum number of simultaneous attendees/visitors:** 90
- **Number of Speakers:** 10
- **Audience and speaker profile:** Participants from Europe and China from telecommunication industry (Altice, China Mobile, China Telecom, China Unicom, Ericsson, Huawei, NEC, NOS Telenor, TurkCell, ZTE, etc..), major industries (ABB, Bosch, Infineon, Intel, TCL, Tencent, etc..), and key research institutions (CAICT, CEA, CTTC, IMEC, IT, VTT, etc..), as well as from industry and public associations (5GACIA, 5GDNA, CCSA, ECC, EU national coordination offices, ETSI, ITU/URSI, etc..)
- **Event Post-Report drafted by:** Fatma Marzouk, with contributions from Networld2020 organization team

Agenda

28th January - Time 9h30–12h30 CET / 16h30–19h30 Beijing	
9h30-10h00	Overview / Key Challenges for Smart Factory ・ *European views, Rui Aguiar, Networld2020* ・ *Chinese views, Zemin Yang, CCSA*
10h00 - 11h00	Smart Factory - What have we achieved ・ *ABB use cases in 5G-SMART , Krister Landernas, ABB Sweden.* ・ *Bosch use cases in 5G-Clarity, Miguel Granda Trigo, Bosch Spain* ・ *TCL use-cases in SmartManufacturing, Yan Cheng, China* ・ *ForwardX use-cases in SmartManufacturing, Shuo Zhang, China*
11h00 - 11h15	Comments and discussion
11h15 - 11h20	Break
11h20 - 12h00	Future Requirements - What will need to be done ・ *Vision from 5GDNA, Jisheng Dai, 5GDNA* ・ *Vision from Networld2020, Jyrki Huusko, Networld2020* ・ *5G-ACIA challenges, Xueli An, 5G-ACIA* ・ *Challenges in standards, David Boswarthick, ETSI*
12h00 - 12h10	Comments and discussion
12h10 - 12h30	How can we progress 5G for SmartManufacturing / Closing Words ・ *CCSA, Zemin Yang* ・ *Networld2020, Rui Aguiar*

- **Objective**

The event aimed to present different views on current and future challenges for integrating 5G communications in the manufacturing areas, covering experiences and perceptions from both Europe and China.

Program Wrap Up

Presenter: *Rui Aguiar (Networld2020)*

Prof. Rui Aguiar presented briefly Networld2020 and described the overall program and stated objectives for this webinar. It then presented the current challenges, with 5G becoming a central piece for the digital transformation of society, creating a changed world, where the telecommunication industry is learning to operate. It finalized by highlighting that exchanging experiences between Europe and China may provide added value and understanding to both parts.

Presenter: Zemin Yang *(CCSA)*

Through his presentation, Mr Zemin.Yang gave a brief overview of the CCSA China Communications Standards Association. He presented the CCSA members, standardization activities as well as its Top Strategic Targets. The later includes, among others, a special focus on Vertical Industrial Digital Transformation. The speaker addressed also how ICT leaders and operators are enabling the industry digital transformation and showcased this with an enumeration of commercial 5G application pilot projects, 5G network investment and Digital transformation fund for vertical industry SME. Furthermore, Mr Zemin talked about the third ”Bloom Cup” 5G Application Competition which contest focuses on industry digitalization, smart living, and digital governance. The presentation included also examples of China smart factories and raised some of their key challenges.

Presenter: Krister Landernas*,* (ABB Sweden)

The presentation described use cases of 5G Smart project, presenting its scope and its key challenges. Through a set of planned work packages, the project targets, among others, the integration, demonstration, and validation of 5G capabilities at three 5G-enabled industry field trials across Europe as well as the enhancement of 5G for smart manufacturing. Activities planned within WP2 at Ericsson Smart Factory, Kista, were further detailed and current progress described. The activities aim essentially to enable 5G connected robots with a remotely supported collaboration between them, as well as machine vision assisted real-time human-robot interaction over 5G. The testbed design being successfully complete, next steps include the testbed implementation, the performance evaluation and the identifications of gaps (eventually the proposal of enhancement).

Presenter: Miguel Granda Trigo, (Bosch Spain)

After presenting a brief overview of Bosch Corporate’s main activities and industrial technology, the presenter detailed the 5G-Clarity project use case. The project aims to develop and demonstrate a beyond 5G system for private networks integrating a set of multiple technologies (5G, WiFi, and LiFi technologies) and managed through AI-based autonomic networking. The presenter highlighted that the envisioned system architecture will enable dynamic deployment of connectivity services, effective slice provisioning along with an overall performance optimization. The speaker translated this vision with the examination of two use cases in Bosch exposing their current and expected status. The two use cases are of i) the wireless network to exchange production Data and the ii) AGV Precise position.

Presenter: Mi Yan Cheng, (TCL)

Mr. Cheng presented the TCL application of Deterministic Networking, with a briefly prelude introducing the extensive industrial base of TCL. It identified the major challenges that the company faces on the factory floor, and how deterministic networking can help solving those problems. It further described the three steps to deploy novel solutions, from building an industrial intranet, expanding into an overall value chain, and developing an integrated ecosystem. An integrated approach for intelligent logistics and digital twins was also described. The presentation concluded with some suggestions both for 5G carriers and industrial departments.

Presenter: Shuo Zhang, *(*Forward Robotics, China)

ForwardXRobotics was presented by the speaker as the industry-leading developer of visual Autonomous Mobile Robots (vAMRs). After stating the main challenges for smart manufacturing (such as High labor cost, complex environment, etc..), and their core target (such as flexible manufacturing, IoT, AI, Data Mining, etc), the speaker presented ForwardXRobotics' solution to address these challenges and cater for these targets. The solution is primarily based on AMR. The presentation detailed also how 5G deterministic networks and AMR solutions are mutually beneficial. Furthermore, the presentation revealed some insights about the technical platform on which the solution relies and illustrated how it can meet the requirement of a Manufacturing Business Case and of a logistic business case.

Presenter: Jisheng Dai, (5GDNA)

The speaker highlighted that 5GDNA focuses on the 5G verticals (Manufacture, Healthcare, Energy, Multi-media, Transportation) and introduced the concept of 5G deterministic network (5GGDN) Service Module. The module reflects that the requirements for industry digital transformation using 5G networks can be divided into three into three dimensions: i) differentiated networks, ii) dedicated networks, and ii) self-service (DIY) networks. This leads to a 3D model of network SLA for industry digital transformation. The speaker emphasized also that Deterministic SLA is a top requirement in Industry Internet. The presentation included also examples of deterministic SLA, proposals of further 3GPP evolution from 5GDNA. Functional proposal includes among others the enhancement of QoS monitoring and of URLLC by more RAN/CN interworking.

Presenter: Jyrki Huusko, (Networld2020)

Dr. Jyrki Huusko first presented the trends driving the development such as the emergence of novel communication technologies as vital tools for smart manufactory to achieve sustainability targets and enable digitalization. Then, the speaker followed up with examples of some smart manufacturing use cases highlighting the technological enabler on which they rely. The speaker further detailed the thematic areas of SRIA related to the Manufacturing Vertical. The areas are namely: System Architecture, Edge Computing and Meta-Data, Radio Technologies and Signal Processing, Network and Service Security. Satellite communications and Optical networks as a backbone for enterprise connectivity.

Presenter: Xueli An, (5G-ACIA)

The speaker started with the presentation of the 5G-Alliance for connected industries and automation (5G-ACIA), its' mission and members. The primary mission is to ensure that the interests and needs of the industrial

domain are adequately considered in 5G standardization and regulation. Secondly, the speaker translated the requirement of smart manufacturing into the main 5G building blocks and deduced that future releases need to cater for further industrial automation requirements. Dr. Xueli showed also how communications for control such as motion control (required for moving and/or rotating parts of machines), and control to control (between industrial controllers) can be very challenging given the high requirement in terms of latency and service availability. After giving a comprehensive overview of the 5G industrial requirement, the speaker concluded her talk with a set of substantial requirements, including: A close collaboration between ICT & OT for unlocking the full potential of 5G.

Presenter: David Boswarthick, (ETSI)

Mr. David Boswarthick's presentation started with a description of the timeline for the most recently finalized 3GPP Release (Release 16) and near-time-future Releases (Release 17 and 18). The speaker provided also an overview of key features within the 5G Releases, highlighting that many industry sectors would benefit from all three of the 5G use case families. After describing the Industrial Participation in 3GPP, the presenter showed the progress made by 3GPP progress towards the support of Industrial IoT and time sensitive networking. Finally, the presenter discussed the different opportunities and challenges arising from the use of 5G for Industrial applications, and concluded with key recommendations.

Conclusions

Mr. ZeminYang and Prof. Rui Aguiar concluded the seminar with some brief words on lessons learned during the session, and with some comments on the necessity to repeat this type of information exchange in the future.

Feedback after the session

Several informal feedback was received after the session, both from European and Chinese participants. There was a large agreement on the feedback, with high compliments on the content of the webinar and on the possibility to establish some information exchange between Europe and China (and requests for further events), supplemented with requests for an agenda that would allow more time for discussion and exchange of views from the attendees.