ITUWebinars

ITU/WHO Workshop on Digital Vaccination Certificate

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13:00 - 18:00 CEST

https://itu.int/go/DVC-21

Summary and results

Noah LUO, ITU-T SG16 chairman
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Nasser Al Marzouqi, ITU-T SG20 chairman

TEST RESULTS
COVID-19

VACCINATED

World Health Organization

ITU

Program (1/4)

- **Opening Remarks**

Master of Ceremony: **Xiaoya Yang**, ITU-T Study Group 17 Counselor
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Chaesub Lee, Director, Telecommunication Standardization Bureau, ITU

- **Derek Muneene**, Director, AI, Digital Health and Innovations Department, WHO

- **Heung Youl Youm,** ITU-T SG17 Chairman | Professor, Soonchunhyang University, South Korea

- **Noah Luo**, ITU-T SG16 Chairman | Vice President, Dept. of Standardization and Industry Development, Huawei

- **Nasser Al Marzouqi**, ITU-T SG20 Chairman

Program (2/4)

SESSION 1: Use cases and technical framework

This session will introduce various use cases for digital certificate services for COVID-19, to identify technical elements and to discuss how services and applications for digital certificates can be implemented.

Session Chair: **Abbie Barbir**, Co-rapporteur ITU-T Study Group 17 Q10 | Senior Security Advisor, CVS Health, United States

- **Daniel Bachenheimer**, Technical Lead, Accenture: *"Digital passport used by airlines also for vaccination certificate?"* [Presentation]

- **Natschja Ratanaprayul**, Technical Officer, Digital Health and Innovations Department, WHO

- **Woojin Jung**, Director for Information and Statistics, Korea Disease Control and prevention Agency | Team Leader for Vaccination System, COVID-19 Vaccination Management TF: *"Coov service: mobile vaccination certificate"* [Presentation]

- **Marie Wallace**, Technical Strategist, IBM Watson Health*: "Multi-credential Verification: The good, the bad, and the ugly"* [Presentation]

- **Kaliya Young**, Ecosystems Director, Covid Credentials Initiative: *"Information structure and trust for certificate"* [Presentation]

Program (3/4)

SESSION 2: Policy and governance aspects – digital certificate federation and interoperability standardization impacts

This session will address policy and governance aspects related to making a digital certificate service unified (federated) ensuring interoperability between various service domains. It includes how mutual recognition can be achieved that supports realistic technical scalability and integrity. It also provides various planned or current activities of SDOs.

Session Chair: Nicole van der Meulen, Senior Strategic Analyst and Head of the Policy & Development team, Europol's European Cybercrime Centre (EC3)

- **Craig Gibson**, Principal Threat Architect, Trend Micro, United States: *"Federation and zero trust in interoperability"*

- **Gautam Hazari**, Technical Director, GSM Association: *"Humanizing the Decentralized Identity - Interoperability through SIM and Mobile Identity"* [Presentation]

- **SangHwan Park**, Director, Blockchain Technology Promotion Division, Digital Infrastructure Group, Korea Internet & Security Agency, South Korea, *"Digital vaccine certificate future directions"*

- **Kesanupalli**, Co-founder, ADI Association, United States: *"Accountability of digital identity in vaccination certificate"* [Presentation]

Program (4/4)

SESSION 3: Panel discussion – future directions for standardization activities

This session will identify future directions that ITU-T SG17/SG16/SG20/WHO needs to study for standardization activities on digital certificates for COVID-19, to suggest potential ways forward to develop technical Recommendations by ITU-T to fill those gaps, to include relationship of ITU-T to WHO activities and suggested timeline for work, and to identify stakeholders with whom SG17/SG16/SG20 will collaborate in the future.

Session Chair: **Masahito Kawamori**, ITU-T SG16 Q28 Rapporteur | Project Professor, Keio University, Japan

- **Daidi Zhong,** Chair of IEEE 11073-PHD | Vice-Dean of Bioengineering College, Chongqing University, China

- **Ivan Herman,** Staff contact for VC & DID Working Groups, W3C: *"Verifiable Credentials and Decentralized Identifiers"* [Presentation]

- **Derek Ritz,** Principal Consultant, ecGroup Inc | Canadian Liaison to IHE International

- **Shan Xu**, Vice-Chair, ITU & WHO Focus Group on Artificial (FG-AI4H) | Senior Executive, the E-Health Department of Cloud Computing & Big Data Research Institute, China Academy of Information and Communications Technology, CAICT, China

- **Jae Hoon Nah,** ITU-T SG17 WP4 Chair & Rapporteur | Special Fellow Researcher, Security Research Laboratory, ETRI, South Korea

- **Marco Carugi,** Mentor of ITU-T SG20 and ITU-T SG13, Q2/20 Rapporteur and Q20/13 Co-Rapporteur

Objectives

The objectives of the workshop were, but not limited to:

- to identify various use cases for vaccination certificates;
- to identify challenges for implementing and federating these vaccination certificates;
- to share on-going activities among relevant groups or international organizations;
- to identify ways forward or directions for ITU-T SG16, SG17, SG20 and WHO to undertake in the future.

Presentation summary – Session 1 (1/2)

Session 1:

- Vaccination certificate context and challenges
  - Global level challenges
  - Challenges faced by governments
  - Individual-level challenges
- Different solutions in terms of enabled security, privacy, inclusivity and finally of interoperability capability in existence or being developed. **Strong needs for verifiable credentials**
- Unlikely to have a universal single standard, rather we will use different strategies, schemas and coding systems, verification protocols. Three key elements in the process: **checking signatures, verifier configuration, rules engine**
- **Complete Privacy Protection**
- Selectively Disclose Information
- Interoperability
- Trust about issuer and consumer of certificates

Presentation summary – Session 1 (2/2)

Session 1 (continued):
- **International Compatibility**
- **Technology Centralized and Decentralized**
- Single versus **multi-credential** verification
- Common credential specifications
- Selectively Disclose Information
- **International Compatibility**
- **Technology Centralized and Decentralized**
- Single versus **multi-credential** verification
- decentralized semantics and harmonization at semantics level
- Common credential specifications

Session 1: Takeaways and conclusions

Takeaways and conclusions

1. Various use cases based on centralized and decentralized approach exist: multi credential, paper certificate, digital certificate using PKI and decentralized identity.
2. Paper-based and QR code-based certificate should be considered for inclusiveness.
3. Vaccination certificate context and challenges
   - Global level challenges, Challenges faced by governments, Individual-level challenges
4. Complete Privacy Protection
   - Selectively disclose information, International compatibility , Technology centralized and decentralized
5. Centralized vs decentralized trust model
6. Single versus multi-credential verification
7. Common credential specifications, Interoperability
8. Trust about issuer and consumer of certificates

Suggestions to ITU-T Study Groups

❑ Invite WHO to submit their specifications to ITU-T.

❑ Work on decentralized identity at ITU to enable designing systems that can provide trust and interoperability.

❑ Work on common and expandable credential with enhanced security capability.

❑ Consider privacy respecting technologies when designing a digital vaccination certificate.

Presentation summary – Session 2

Session 2:

- **Identity is a Data Architecture**, more than just an interface specification
- Common understanding of rules for data interoperability must be adopted
- Common rules for **abuse detection and counter-measure** should be shared as well as timely examples of this abuse
- Real world security effects of globally-recognized identity (vaccine certificates) should be recognized and responded to
- The ability to re-mediate abuse (fraud, revocation, denial of service, etc.) should be included in standards
- **Recommended for standardization: need Identity as Data Architecture, common rules for data interoperability, rules on common identity metadata**

Session 2: Takeaways and conclusions

Takeaways and conclusions

1. Identity is a data architecture, not just interface specification.
2. Vulnerability for QR code-based implementation should be considered.
3. Consider use of hardware security module such as SIM card in the mobile device.
4. Consider decentralized approach based on SIM card.
5. Centralized approach vs decentralized approach should be considered.
6. Common understanding of rules for data interoperability must be adopted.
7. Common rules for detecting abuse should be shared as well as timely examples of this abuse.
8. Real-world security effects of globally-recognized identity (vaccine certificates) should be recognized and responded to risks.
9. The ability to remediate abuse (fraud, revocation, denial of service, etc.) should be included in standards.

Suggestions to ITU-T Study Groups

❑ Consider use of HSM or SIM to implement digital vaccination certificate.
❑ Identity management abuse may result in blocking of unknowing victims. This revocation of blocking should be captured in standards (SG17).
❑ A person who has been determined as passing a COVID-19 test may later be infected. The revocation of status must be captured in standards.
❑ Interoperability of a data architecture is based strongly on metadata; the rules on common identity metadata must be standardized.
❑ Consider use of SIM in the mobile device for expanding trust across the countries.
❑ Initiate work on digital vaccination certificate using decentralized identity.

Presentation summary – Session 3

Session 3:

- Different organizations are to be involved to build a **core system of technical standards**, we need harmonization, good division of work, smooth communication and a seamless synergy

- **Existing work** from ITU-T, WHO, ISO/IEC, W3C, IEEE etc. is to be well studied and analysed as a valuable basis to see the way forward clearly and we can be wisely avoid re-inventing the wheel

- Interoperability is eventually to be provided and achieved through standardization

- Strong relationship between use cases and standardization. Gaps analysis and roadmap rely on thorough understanding of the real needs

- Be well prepared for **uncertain challenges** based on past experienced and make good **practical plans**. Standards work usually take longer time then they are originally thought to take

- Good balance between ambitions and the need to meet **very challenging time needs** to race against COVID-19, be very careful with the **scope, breadth, depth of our standards work**

Session 3: Takeaways and conclusions

Takeaways and conclusions

1. Device interoperability should be considered.

2. QR code-based implementation using Decentralized identity technologies should be considered, e.g., Korean use case on mobile vaccination certificate called Coov.

3. Consider current WHO documentation on digital document for COVID.

4. Security, privacy and identity should be top tasks for standardization.

5. Work tasks for standardization can be categorized into three: data model, infrastructure and security/privacy/trust.

Suggestions to ITU-T Study Groups

❑ Divide short term and long-term solutions for digital vaccination certificate.

❑ Seek a core, simple solution and liaison with W3C for defining verifiable credential.

❑ Use vocabularies which are defined by WHO and define core data set for digital vaccination certificate.

❑ Conduct a gap analysis and establish a roadmap for standardization for digital vaccination certificate.

❑ Focus on decentralized approach for a potential solution considering inclusiveness.

❑ Work with the Joint Initiative Consortium.

Suggestions overall (1/6)

Suggestions overall:

❑ Closer collaboration with WHO, W3C, GSMA, LF and other organizations for similar minds and objectives for a harmonized ecosystem supported by **a core system of technical standards**, leveraging the advantages and strengths of each organization

❑ Invite WHO to submit their specifications to ITU-T

❑ Work on **decentralized identity** at ITU to enable designing systems that can provide trust and interoperability

❑ Work on common and expandable credential with enhanced security capability

Suggestions overall (2/6)

- Suggestions overall (continued):

  ❑ Identity management abuse may result in blocking of unknowing victims, which will make a good subject to study to be able to manage abuses while not blocking innocent users.

  ❑ **Multiple infections**: A person who has been determined as passing a COVID-19 test may later be infected. The revocation of status must be captured in standards.

  ❑ **Interoperability of a data architecture** is based strongly on metadata; the rules on common identity metadata are to be studied for standardization.

Suggestions overall (3/6)

Suggestions to SG17:

❑ Consider adopting into ITU document the WHO document on "Digital Documentation of COVID-19 Certificates: Vaccination Status".

❑ Consider standardization for identifying threats and risks for digital COVID-19 certificate-based services.

❑ Consider standardization of trust and security model for digital COVID-19 certificate-based services using decentralized identity technology.

❑ Consider forming a joint ad hoc of Questions among SG16, SG17, SG20 to facilitate speedy developing technical Recommendations for digital COVID-19 certificate.

❑ Consider a follow-up ITU workshop on digital COVID-19 certificate in conjunction with ITU Telecom during the period of September – December 2021.

Suggestions overall (4/6)

Suggestions to SG16:

❑ Consider in the context of current SG16 work on digital health including Q28 and FG AI4H,etc, how the needs for vaccination certificate can be well supported and what is the new work to be needed.

❑ Consider new use cases and scenarios to be provided for study under Q22 for DLT technologies and applications.

❑ Consider adopting into ITU document the WHO document on "Digital Documentation of COVID-19 Certificates: Vaccination Status".

❑ Contribution of experience of working with WHO in the past on digital health related subjects to benefit the potential collaboration on vaccination certificate.

❑ Consider forming a joint ad hoc of Questions among SG16, SG17, SG20 to facilitate speedy developing technical Recommendations for digital COVID-19 certificate.

❑ Consider submitting contributions / subject report to ITU-T CTO Group meeting in late 2021 to boost the attention from industry high-level leadership.

Suggestions overall (5/6)

Suggestions to SG20:

❑ Likewise SG17 and SG16, consider adopting into ITU document the WHO document on "Digital Documentation of COVID-19 Certificates: Vaccination Status".

❑ Likewise SG17 and SG16, consider forming a joint Rapporteur group among SG16, SG17, SG20 to facilitate speedy developing technical Recommendations for digital COVID-19 certificate.

❑ Consider the diverse use cases and scenarios with associated requirements, with the involvement of all key stakeholders, and looking forward (also) to enduring - longer term - solutions.

❑ From an Internet of Things (IoT)/ Smart Cities and communities' perspective, a digital vaccination certificate supporting system could be approached systematically like an IoT enabled system for other verticals/services, with identification of scenarios, service requirements and service flows, as well as IoT enabled capabilities and functions, data models, architectures, interfaces and protocols. Consideration could be given to devices, platforms and other facilities which may be used to support the service flows. The identified security, privacy and trust requirements would have to be supported by (digital COVID-19 certificate service specific or generic) enabling functions in devices, platforms and other facilities.

❑ Contribution of experience of working in IoT enabled systems for the support of different verticals/services.

Suggestions overall (6/6)

For TSAG

❑ Submit the workshop report and outcomes for TSAG consideration.

❑ Establish a joint SG16, SG17 and SG20 FG on Digital vaccination certificate in collaboration with WHO.

❑ Encourage the three SGs to initiate work on how to establish collaboration in consultation with TSAG for example joint Rapporteur Group to accelerate the work on this important subject.

We are moving up!

- ✓ **Vision**
- ✓ **Communication**
- ✓ **Synergy**
- ✓ **Getting things done**

Thank you!