Digital Vaccination Certification: South Korea

韓国における新型コロナワクチン接種証明書のデジタル化

「COVID-19とデータ倫理」セミナー
March 7, 2022
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Agenda

01 Introduce South Korea's digital vaccination certification system

02 Discuss implications and issues associated with the system

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OVERVIEW

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COOV

- World's First **Blockchain-based COVID-19 Vaccination Verification System**
- A digital vaccination verification system allows vaccinated individuals to present their proof of vaccination by using a **QR code**.

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COOV

- **Cross-identification**: Use as one's own vaccination certificate and to verify another person's vaccination verification
- Can be embedded into a QR code used for contact tracing
- Used in conjunction with a government-issued sticker for vaccination certification for those who are unable to utilize the app
- The verification of vaccination for certain public activities is only valid:
  - 14 days after the administration of the first or second dose
  - Six months after the administration of the first or second dose
  - For the third dose, the vaccination certification is immediately valid upon administration, and there is no end date for its validity

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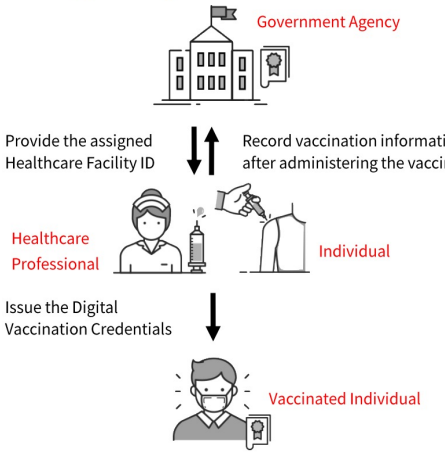
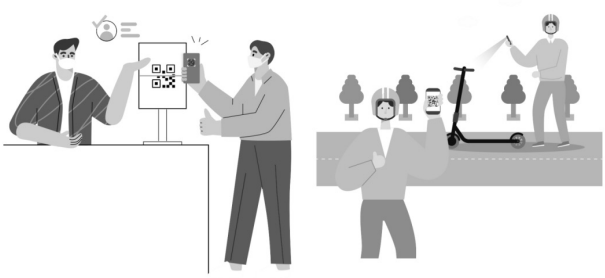
Issuing the Digital Credentials



Using the Digital Credentials

Get the digital vaccination credentials verified by scanning each other's QR code



*The proof of vaccination can be verified without exposing any personal information

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Additional functions

- Reserve the next vaccination without having to input personal information again
- **Personalized post-vaccination management**: Verify the remaining validity of the latest dose for vaccination certificate and reminder for the subsequent vaccination schedule
- **Report potential side effects** from the vaccination
  - Based on the report, the local health center will assist the person
- Can be also used to provide additional information such as name, date of birth, nationality, and passport number, if necessary
- PASS INFRA can be used to verify not only COVID-19 vaccination, but also all kinds of vaccinations

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TARGETED PROBLEM SOLVING

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Solving Targeted Problems

"A normal digital vaccination verification system is vulnerable to fraud/tampering because it is difficult to verify the authenticity of the proof of vaccination."

"Vaccination verification system holds the users' personal and vaccination information, which can risk exposing sensitive data to an unintended audience."

"If the vaccination verification system is not designed to be compliant with the global standards, its international interoperability is severely limited."

KCDA & Blockchain Labs(2021).

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Solving Targeted Problems

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Maintaining integrity of the certificate

- Prevent forgery and fraud by…
  - Using decentralized identifiers (“DIDs”) so that the issuer’s and the owner’s ID, once recorded, cannot be changed or manipulated
  - Enabling verification of whether credentials written in the blockchain are revoked, preventing users from using a revoked credential (i.e., once the owner re-issues a credential on a new mobile device, the old one is automatically revoked)

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Decentralized Identifiers

- “DIDs are a new type of identifier that enables verifiable, decentralized digital identity... In contrast to typical, federated identifiers, DIDs have been designed so that they may be **decoupled from centralized registries, identity providers, and certificate authorities**.” (W3C, 2021).

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Maintaining integrity of the certificate

- "**It's nearly impossible to fake data on a blockchain, and users' information can be stored securely since information can't be modified and third parties neither enter nor destroy the data**…With a blockchain-based passport, a medical provider issues a vaccination certificate that includes a private key individual to the user. At the same time, a public key is stored in the blockchain. If the user presents the vaccination certificate as a QR code in an app, the verification agency can scan the QR code to check the minimum information related to vaccination. In addition to vaccination-related details, users can choose whether to disclose information that can identify individuals, such as their names, date of birth and nationality. In this case, **users can protect their privacy and only prove the vaccination record**" (Forbes, 2021).

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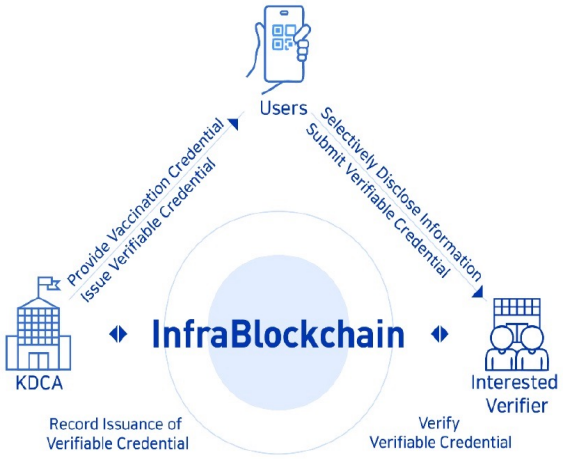
Privacy and security

- Using blockchain-based DIDs, COOV **prevents the government from accessing or storing sensitive personal information**.
- DIDs allow individuals to control their own personal information and create peer-to-peer networks.
- Provide **selective disclosure** option: Allow the proof of vaccination to be provided without exposing any personal information.



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Increasing international operability

- PASS INFRA invites governments and agencies to utilize the app by adopting and modifying the app to meet various needs by governments and agencies.
  - COOV or PASS INFRA is **available for governments and institutions around the world to use for free.**
- PASS INFRA **complies with the global standards** of W3C DID and utilizes other global standard libraries such as Universal Resolver, to collaborate with DIDs based on more than 40 public and private blockchains.
- Blockchain Lab works with the Linux Foundation to make their apps available for international adoptions by creating the **Global COVID Certificate Network** ("GCCN") to facilitate the safe and free movement of individuals globally during the COVID pandemic.

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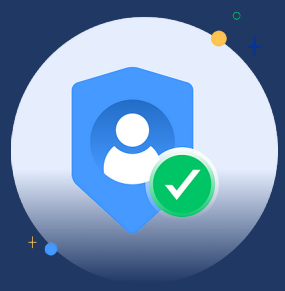

IMPLICATIONS

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1 Using the digital certification for vaccine mandate

- Apart from the use of digital technologies, mandating proof of vaccination itself is controversial.
- Requiring proof of vaccination also means that any malfunctioning can cause social chaos.
  - On the first day of mandated proof for vaccination for certain public activities, some users reported malfunctioning of the app.

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2 Potential concerns for discrimination

- **In the beginning,** it was not possible to effectively reflect their vaccination records on COOV if they have been vaccinated in other countries. With the vaccination requirement limiting public activities for those who cannot prove their vaccination, **consistent criticism for discrimination** has been raised.
- **Now,** those who have been vaccinated abroad need to bring an official certificate to apply it to COOV.

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3 In the perspective of data ethics

- **Utilizing technology for privacy and security**: Allowing the users to prove their vaccination records with a QR code by using the DID blockchain server through their smartphone can properly address privacy and security concerns.
- However, **public education** that can alleviate the concerns about their personal information getting used without their consent needs improvement.

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FINAL THOUGHTS

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COOV: Evaluation

- Digital vaccination certification signifies the **advancement of technology-facilitated healthcare system** in South Korea.
  - Almost universal adoption by its citizens, enabled by high rate of cellphone ownership
  - Easy, secure and streamlined process to mandate vaccine certification
- **Nonetheless,** some issues remain unresolved.
  - The necessity of vaccine mandate using COOV is socially and legally disputed.
  - The policy makers should be more aware of equality and potential discrimination concerns.
  - Public education about technology needs to be improved.

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