4IR Technologies to respond to COVID-19 challenges and sustainable recovery

- Lessons from South Korea
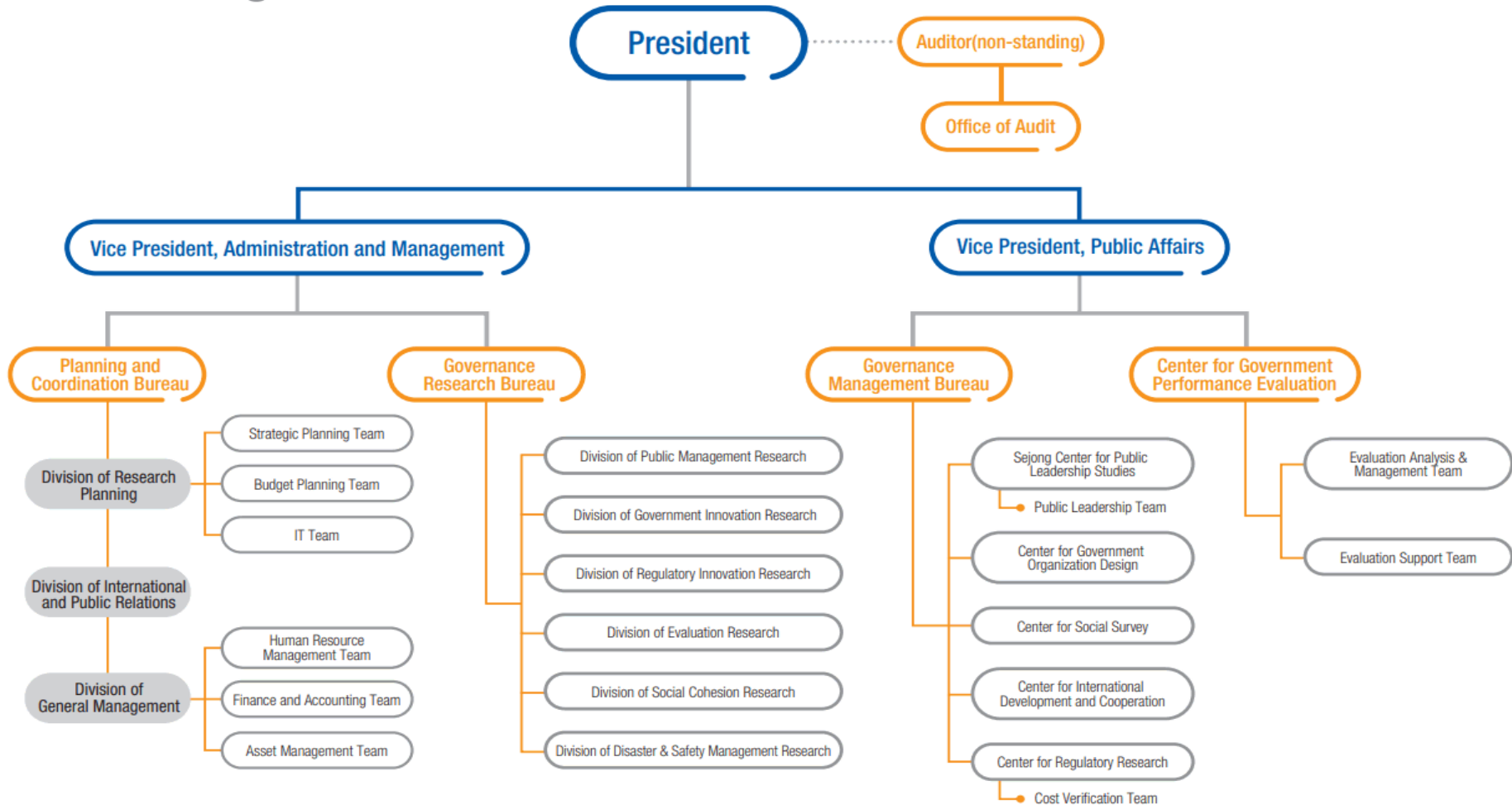
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KIPA Korea Institute of Public Administration

Korea Institute of Public Administration leading the innovative and inclusive government

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- Center for Government Organization Design
- Center for Social Survey
- Center for International Development and Cooperation
- Center for Regulatory Research
  - Cost Verification Team

Center for Government Performance Evaluation

- Evaluation Analysis & Management Team
- Evaluation Support Team

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- 4IR Governance of Korea

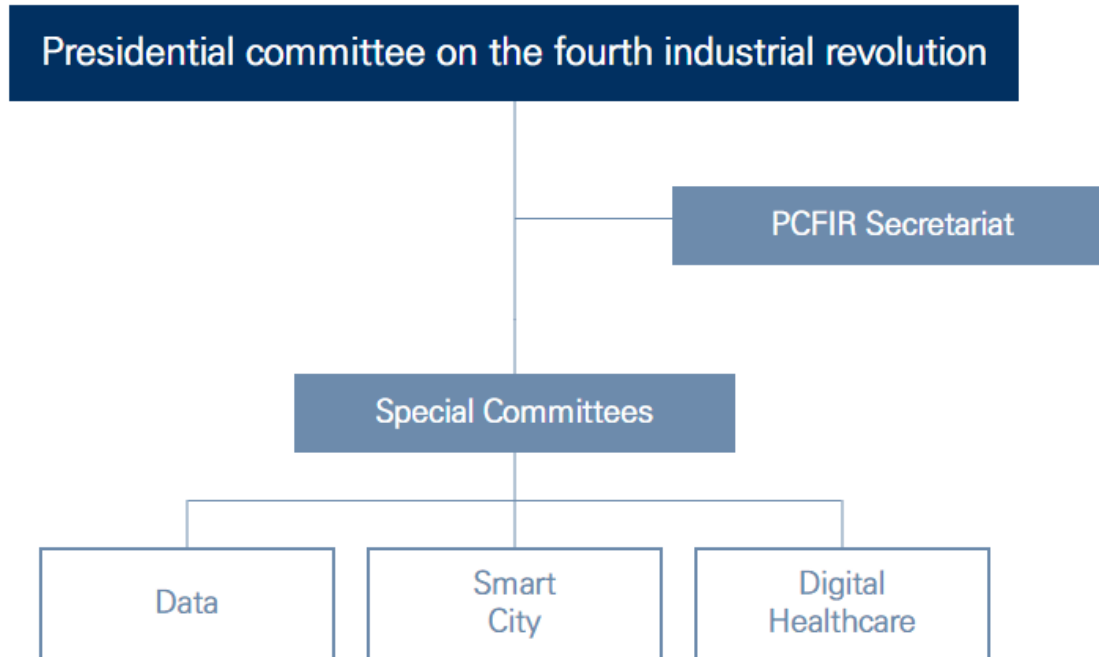✓ Response to COVID-19

- K-Quarantine Model(3T+α) & its outcome

✓ Contribution of 4IR Technologies

- AI, Big Data, Block Chain

✓ Concluding Remarks

- Successful factors & remaining challenges

4IR Governance in South Korea

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│   Presidential committee on the fourth industrial revolution │
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                              │          ┌──────────────────────┐
                              ├──────────│   PCFIR Secretariat   │
                              │          └──────────────────────┘
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                    ┌───────────────────┐
                    │ Special Committees │
                    └───────────────────┘
                              │
            ┌─────────────────┼─────────────────┐
     ┌────────────┐    ┌────────────┐    ┌────────────┐
     │    Data    │    │   Smart    │    │  Digital   │
     │            │    │    City    │    │ Healthcare │
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- Deliberates upon and coordinates policy measures submitted by various ministries and the committee members
- Organizes public campaigns related to the 4th industrial Revolution and encourages public participation
- Prepares the groundwork for regulatory and institutional reforms in support of public-private partnerships
- Fosters ecosystems for new industries (Special Committee on Data, Smart City, Digital Healthcare)

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Response to COVID-19 (I)

- K-Quarantine Model (3T + α)

  - **T**esting: large-scale diagnostic testing

  - **T**racking: tech-powered aggressive contact tracing

  - **T**reatment: treating those infected at the earliest stage

  - Civic Engagement

    : Implementing polices via clear communication & citizen
    participation

  - Innovative policies including 4IR technologies

    : Drive-thru, Walk-thru, Mask-app, Self-Diagnosis & Self
    Quarantine App., Self-Quarantine AI Call Center etc.

Response to COVID-19(II)

- Korea has controlled the Coronavirus relatively well without lockdowns but currently confronts a 4th big wave (daily No. around 1,500 patients)
- Current fatality rate is lower than 2% due to high vaccination of senior citizens

Response to COVID-19(III)

- Korea contained COVID-19's impact with effective policy responses reduced infections and limited economic downturn
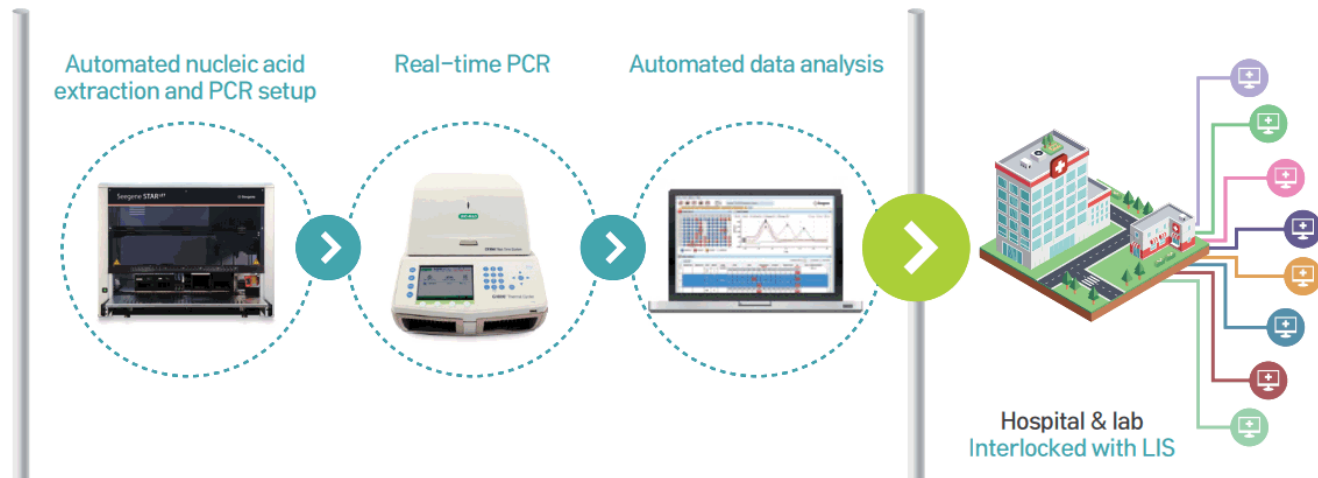 (impact on G20 advanced economics)

COVID-19 Infections and Real GDP Growth Impact
(impact measured as estimate of 2020 growth minus Jan 2020 projection)
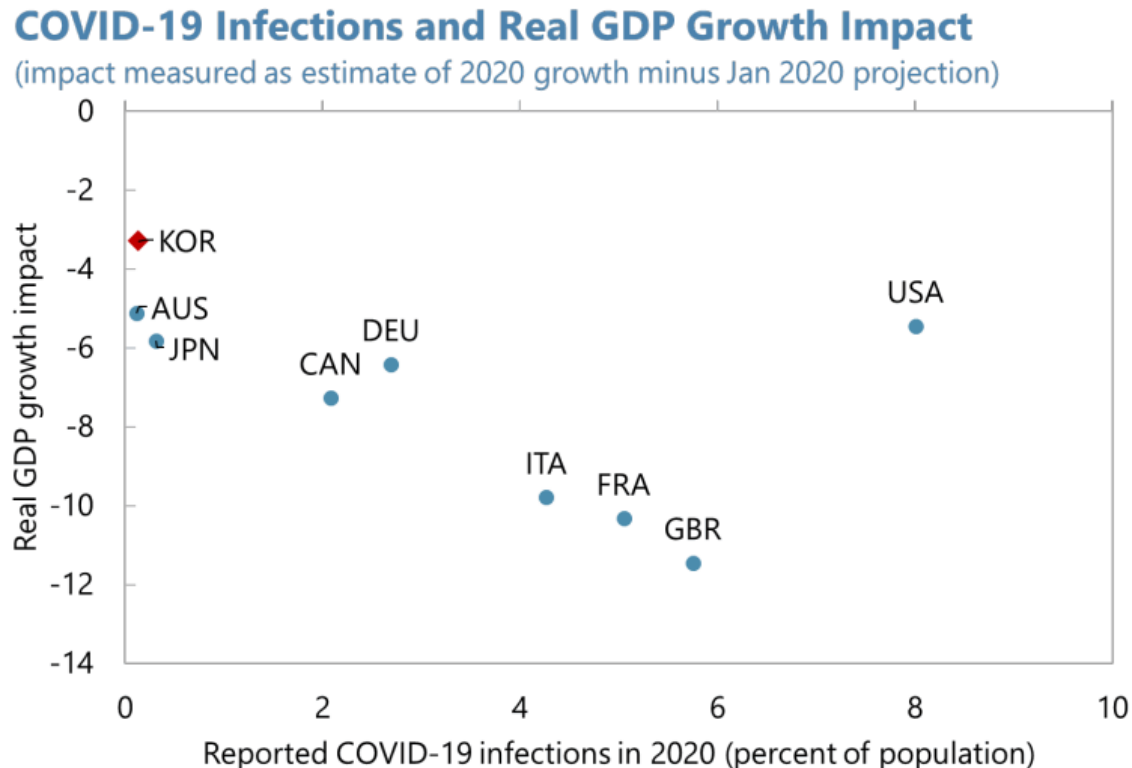
Source: : IMF(2021). Republic of Korea. Country Report No.21/64

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Contributions of 4IR technologies(I)

- [Testing] The Korean private company Seegene developed a COVID-19 test kit using AI algorithms in about two weeks, through the EUAS(Emergency Use Authorization System), significantly reducing development time and costs.

    → Seegene's All-in-One Platform enables detection of hundreds of infections on a single platform

Automated nucleic acid extraction and PCR setup   Real-time PCR   Automated data analysis   Hospital & lab Interlocked with LIS

Source: : Min. of Science and ICT(2021). How we fought COVID-19

Contributions of 4IR technologies(II)

- [Tracing] Ministries collaborated to launch an Epidemiological Investigation Support System (EISS), which can quickly identify the movement of confirmed COVID-19 cases and analyze transmission routes, using the person's location data and credit card transaction history.

- Big data analysis produces real-time data on patients, including their whereabouts and the time spent at each location, and predicts areas at risk of an outbreak of infection.

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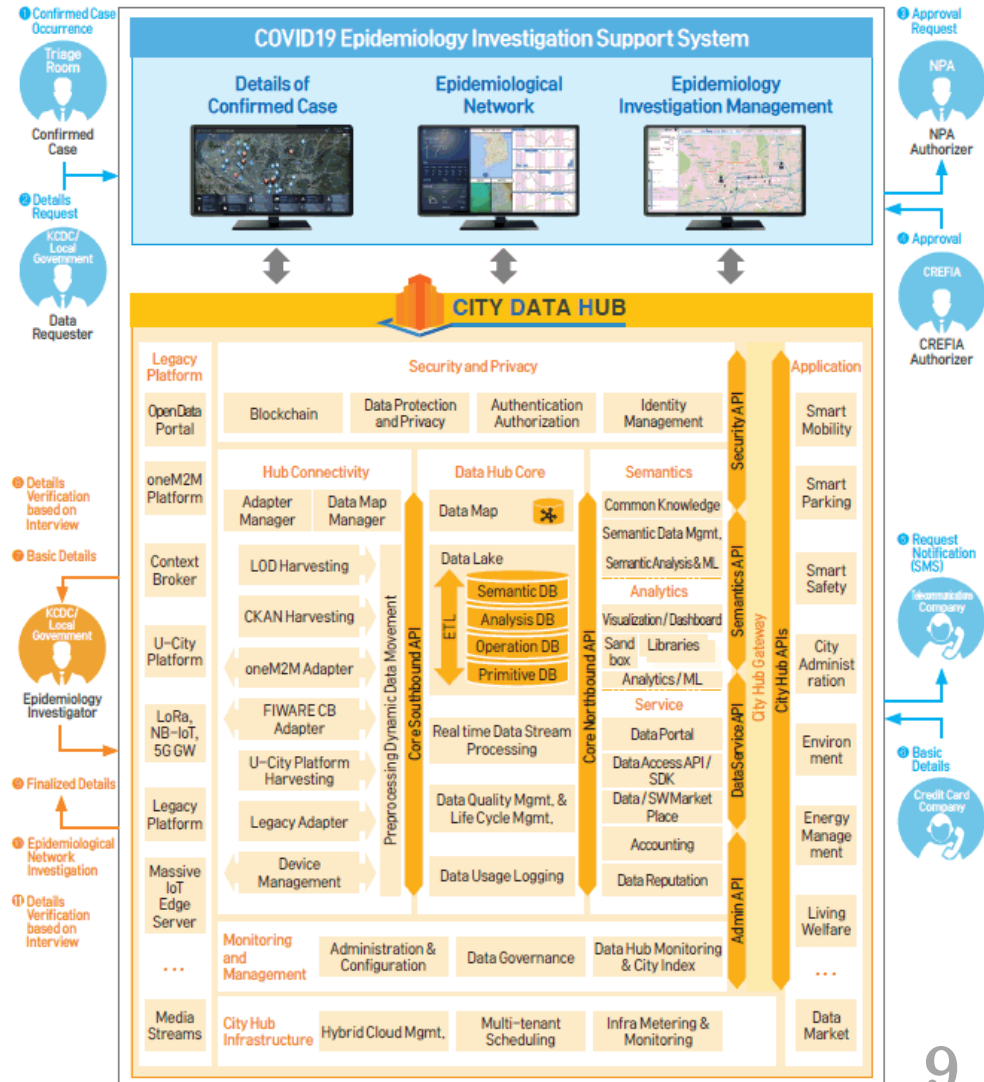
Contributions of 4IR technologies(III)

- [Vaccination Verification] Block Chain Lab launched the world first block chain-based digital COVID-19 vaccination verification system (COOV) on mobile devices. It provides privacy protection, cross-verification of digital credentials, and prevents forgery and fraudulent use.
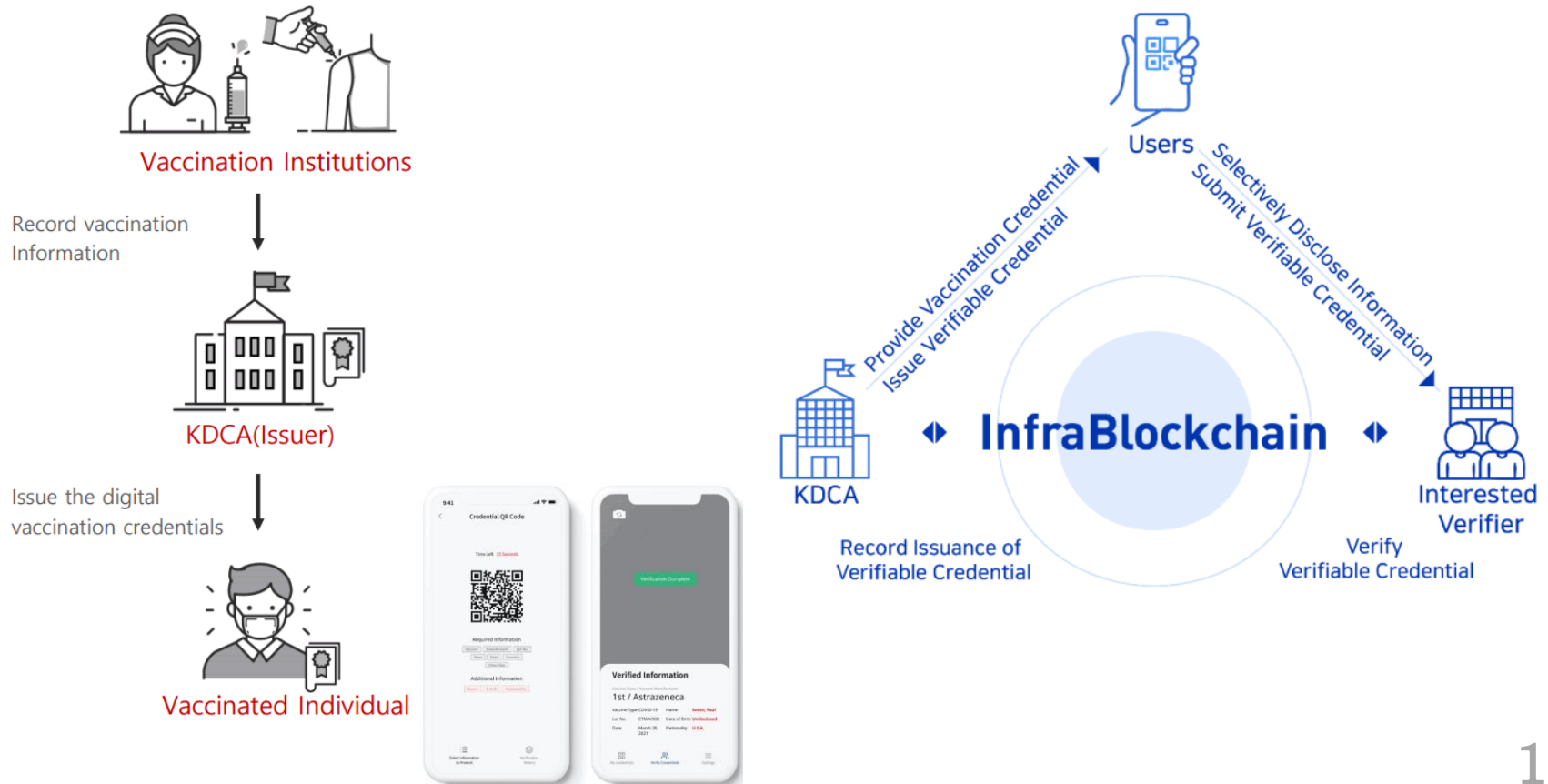
Concluding Remarks (I)

- As necessity is the mother of invention, the pandemic has brought the dawn of the 4IR of Korean technologies. They have contributed to a governmental successful response against COVID-19.

- First, the pandemic has had much <u>uncertainty</u> so far. It still spreads many variants, i.e. alpha, beta, gamma, and delta viruses. We need clues to fight well, and 4IR can easily detect viral strains using advanced technologies.

- Second, the pandemic is a <u>wicked problem</u> not to be solved by a single organization. It needs cooperative response not only among public organizations but also inbetween public and private sectors.

Concluding Remarks (II)

- Despite the potentials of the 4IR technologies, there are still challenges in utilizing them to fight pandemics.

- First, producing and sharing reliable data is the fundamental base of 4IR.

- Second, 4IR hurdles like digital divide can be found within minorities including senior citizen and foreigners. Education them for 4IR literacy is needed.

- Third, there are public safety and security concerns using those technologies because they deal with personal information and data. The government should consider guidelines for using such technologies regarding authorization, supervision, monitoring etc.

Thank you!