Korea Measures against COVID19

**Medical Logistics,
Rapid Analysis & Real-time Communication, and
Smart Infrastructure**

Korea Agency for Infrastructure Technology Advancement (KAIA),
Korea Electronics Technology Institute (KETI), and
KPMG Korea

I. Comparison of Medical Systems between NHS and NHI Countries

According to an analysis of eight countries, confirmed cases and mortality rates in countries that provide medical services based on taxes for national health service such as Italy, Spain and Britain tended to be high.

On the other hand, countries that have adopted the national (public) health insurance with private hospitals, such as Germany and Korea, are managing the situation relatively well.
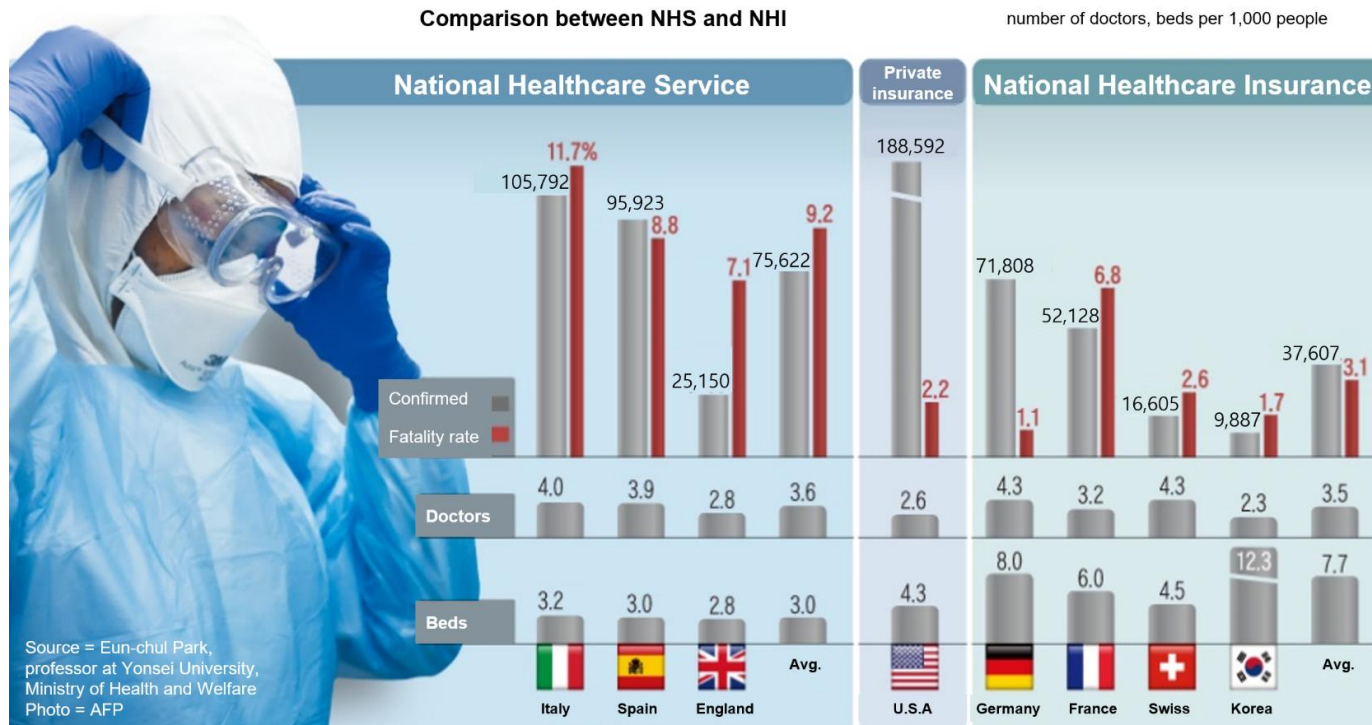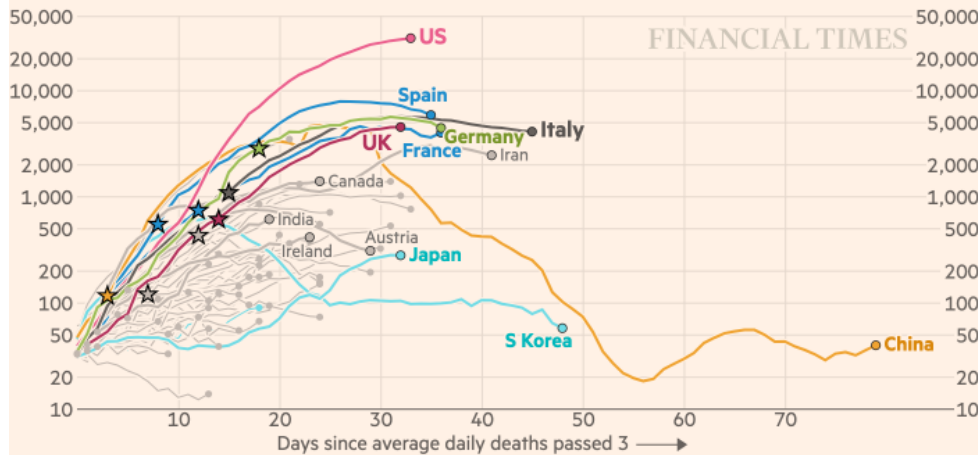

Figure : Comparison table of countries with NHS and NHI (the number of doctors, beds per 1,000 people as of April 1st)

II. Tracing Confirmed Patients' Moving Path in 10 Min. through Smart City Data Hub (1/7)

The graphs in Financial Times on confirmed cases by country and counts of deaths by city show the widely ranged differences. The number of new confirmed cases in Korea is either maintained or lowered, and so does the number of deaths in Daegu. Looking into Korea to find out and share the explainable root causes can contribute to the coping strategy of other countries.

Figure : COVID19 Statistics by Country, City

Through consultations with the KCDC* and related authorities, the data hub infrastructure contributed to tracking huge information of confirmed cases such as GPS location, telecommunication network usage, and digital payment.
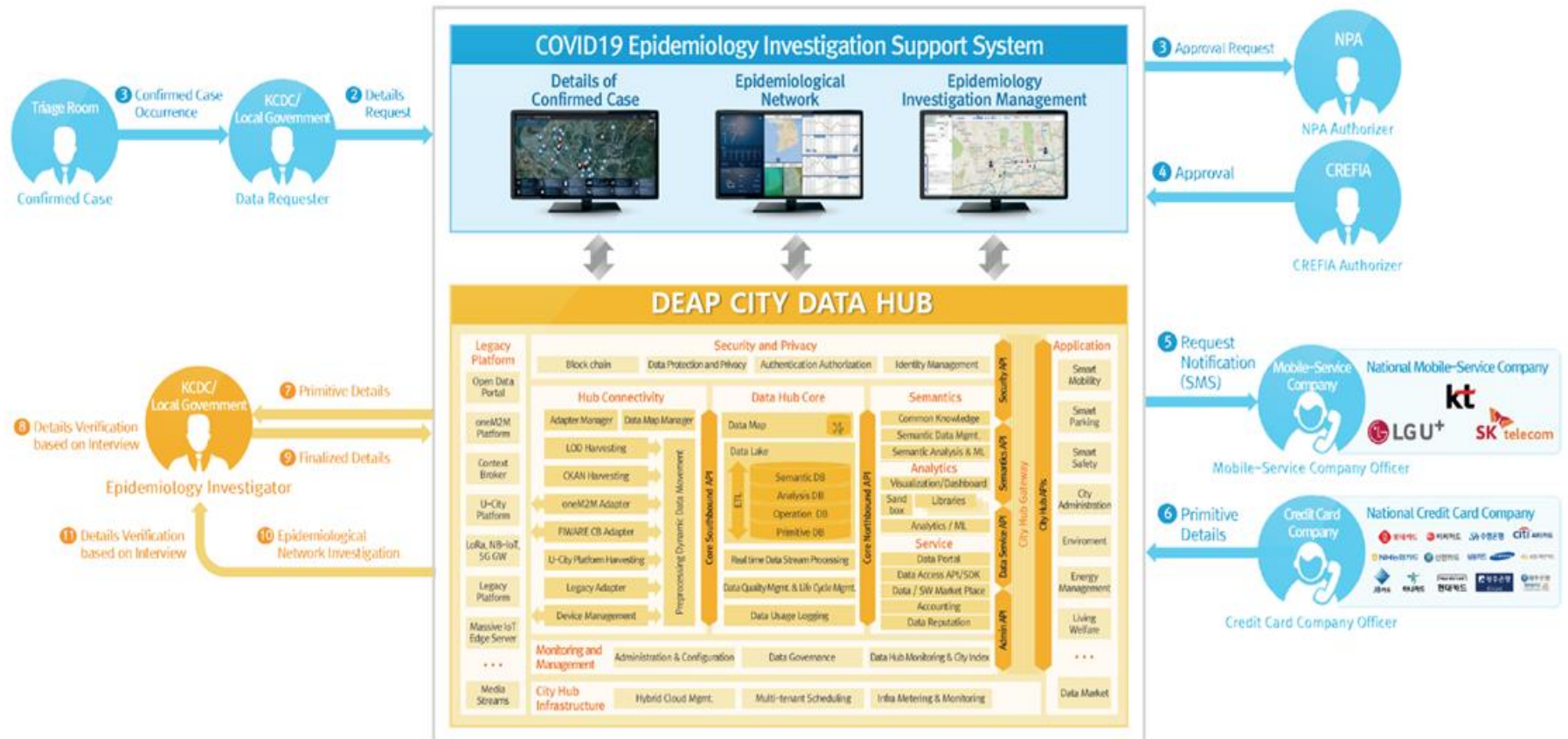
Figure : : Flowchart of Operations in Epidemiology Investigation Support System   *KCDC: Korea Centers for Disease Control and Prevention

Information on the time and place obtained from the confirmed patients' movements can be traced through information such as credit card usage information, mobile phone location tracking, digital payment usage, and sometimes those of CCTV if necessary.
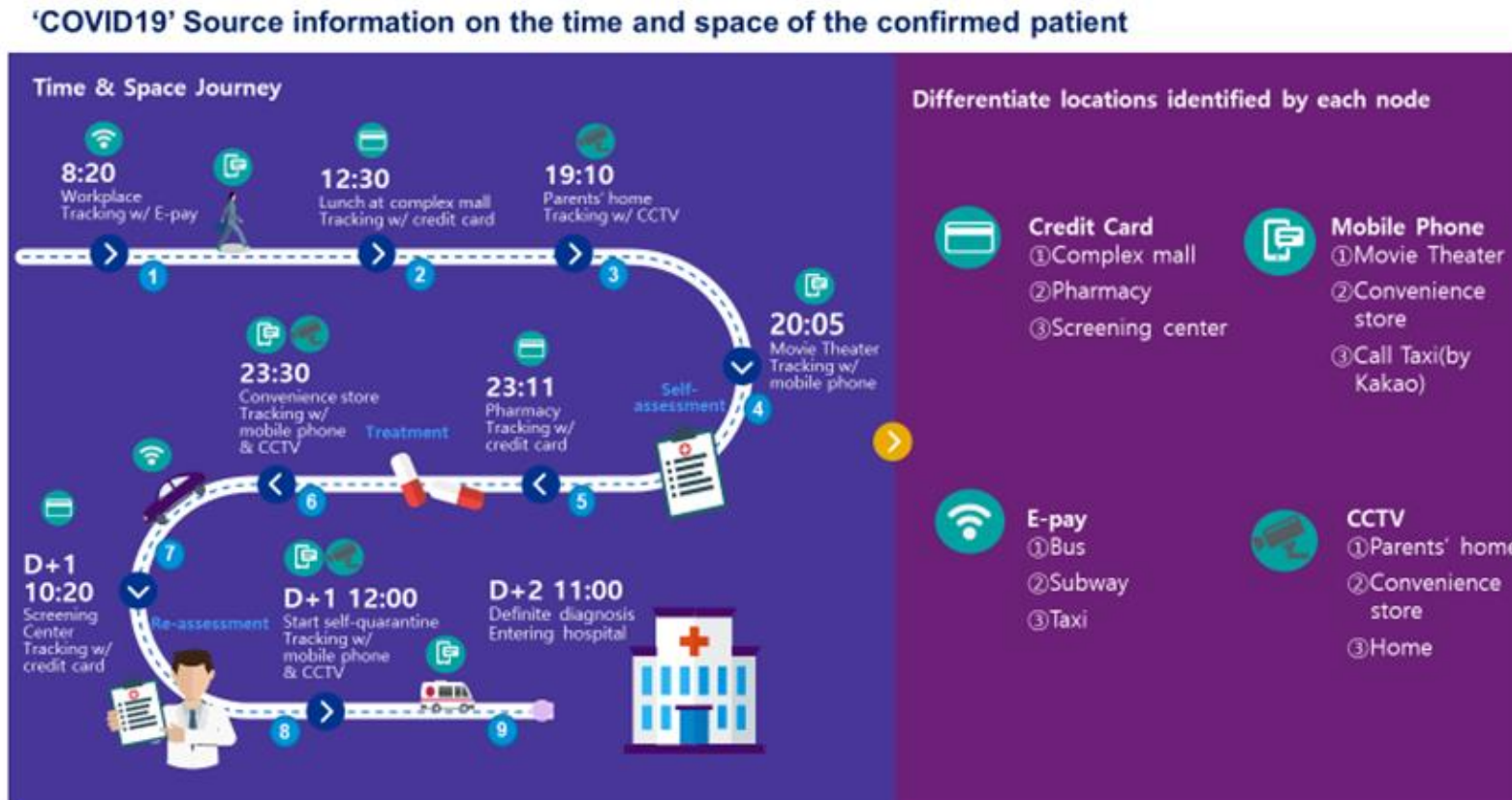
Figure : Construction of Information by Time

The use of geo-spatial information enables interested parties to communicate instantly because the information is presented in an intuitive visualization, map of digital threads, multiple of time and place.
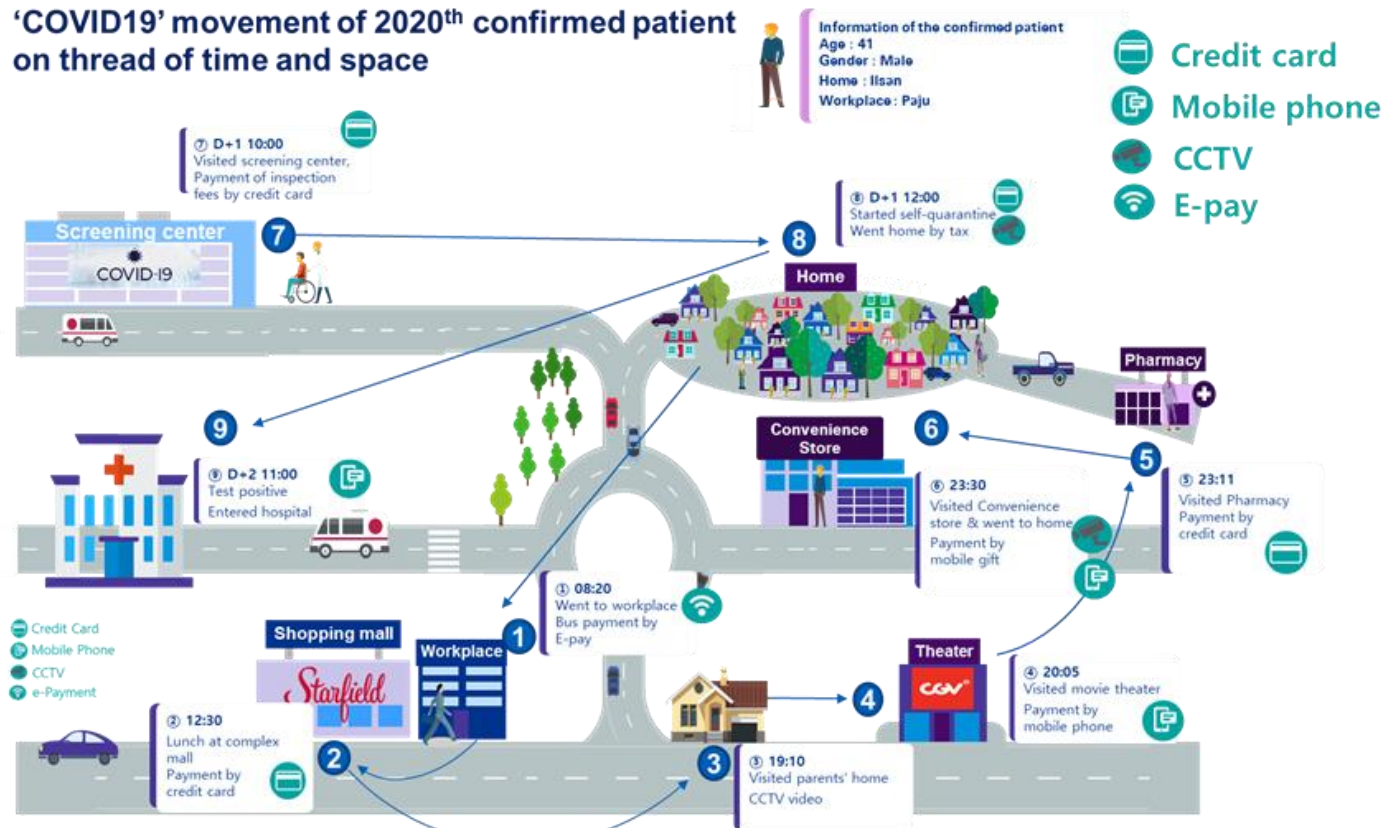
Figure : Time and Geo-spatial data on Visualized Map

The core function of the COVID19 epidemiology investigation support system established by DEAP CITY program of KAIA and KETI is to trace the moving paths of the confirmed person in 10 minutes.

Figure : Ten Minutes Processes of the Epidemiological Investigation Support System

It takes 10 minutes on average to track the movements of the confirmed person to carry out the nine processes of the epidemiological investigation support system, including the approval process of the authorities, NPA and the Credit Finance Association.

	Epidemiological Investigation with 9 Processes	Interested Parties
1	Collecting information and checking validation	Major 3 Telco., Credit Finance Association
2	Processing big data by leveraging data hub infrastructure	Smart City Data Hub (DEAP CITY), KAIA, KETI
3	Time and geo-spatial information analysis of staying and overlapping to create digital threads and network analysis thereof	KCDC, KETI
4	Master data management of patients, contactors, and those of interested parties such as hospitals, epidemiologists, data providing organizations, approval authorities, etc.	KCDC, hospitals, diagnosis stations, etc., 28 organizations in Total
5	Approval request, permission, and log records ensuring the protection	NSA, Credit Finance Association
6	Time and geo-spatial information of moving paths with staying time (time x space = digital thread)	KCDC, KAIA, KETI
7	Network analysis of the expansion of contagion and hot spots of confirmed cases	KCDC, KAIA, KETI
8	Communication and decision making based on intuitive visualization map of digital threads (moving paths and distribution, and master data of the confirmed patients)	KCDC, hospitals, diagnosis stations, municipal authorities
9	Communication and decision making based on intuitive visualization map of accumulated digital threads of time and space	KCDC, hospitals, diagnosis stations, municipal authorities

Table : Nine operation processes of the Epidemiological Investigation Support System

The system presents four user interfaces for communication among interested parties to make communication and decision-making to minimize contagion risks and maximize quarantine effects: Moving Path by Timeline, Network Effect Analysis, Map of Confirmed, and Master Data Management.

Figure : Four User Interfaces of the Epidemiological Investigation Support System

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III. Instant Application of Smart Infra: Drive/Walk Thru, Self-Quarantine & Moving Path App., and Logistics for Masks

Drive/Walk Thru (medical device development), Self-Quarantine & Moving Path App (civic participating quarantine campaigns), and Logistics for Masks (manufacturing chain and 5 day rotation distribution) are in line with the medical treatment and quarantine strategy to win the war against COVID19.
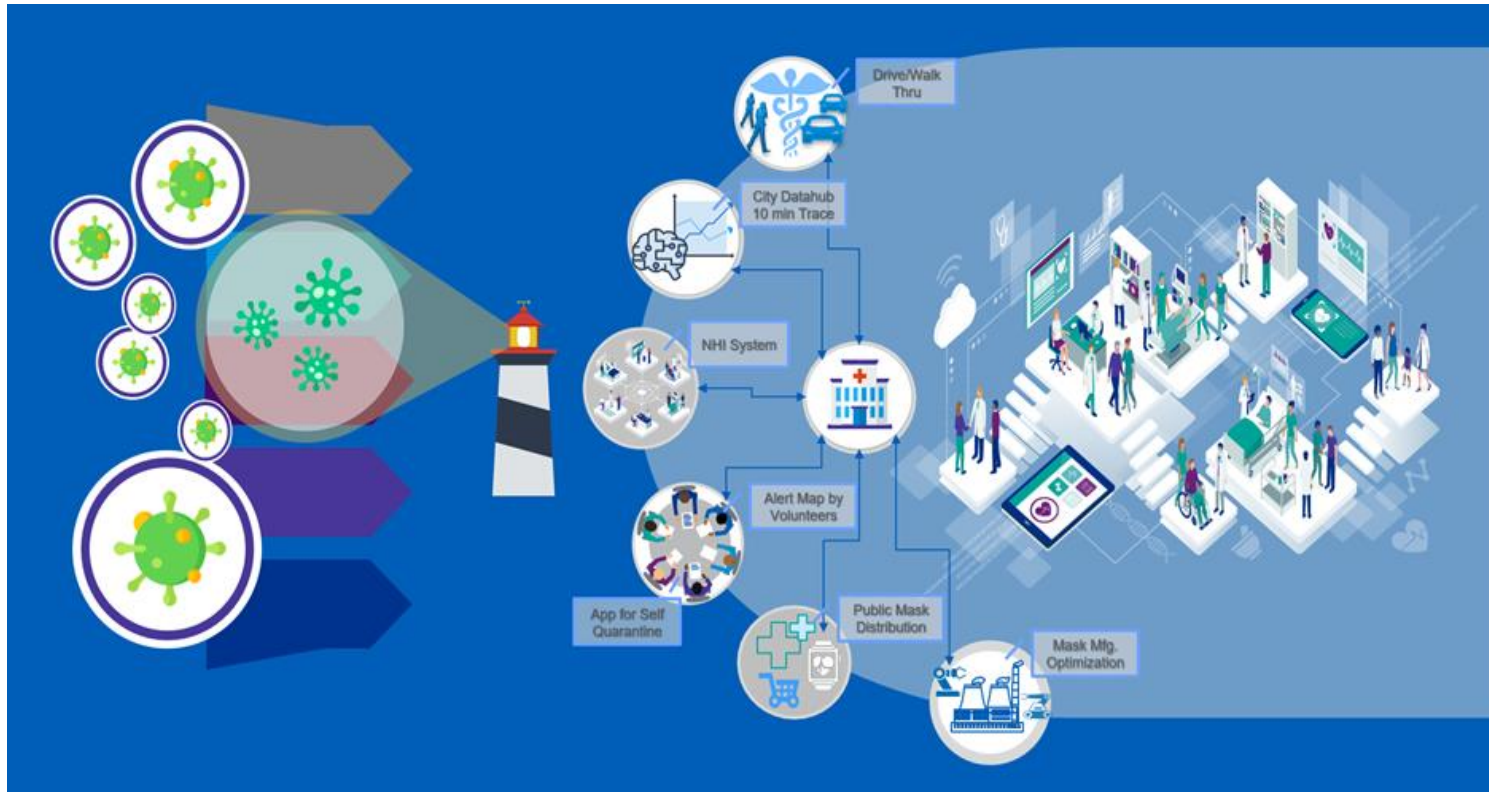
Figure : NHI System, Trace in 10 Min., and Smart Infrastructure Protecting Medical Resources

III. Instant Application of Smart Infra: Rapid Deployment of Smart Device (Drive/Walk Thru)

The implication of those measures is that it **quickly manufactured, distributed and spread creative solutions, protecting hospitals from infection sources across the country, and simultaneously relieving patients with symptom from the secondary infection at hospitals where suspected patients convene**

Figure : (Up)Drive Thru Screening Center, (Down) Walk Thru Safety Booth

III. Instant Application of Smart Infra: Self-quarantine App. by Government vs. Moving Paths of Confirmed Cases App. by Volunteers

The self-quarantine app. advising the suspicious patients before confirmation to help them to stay home and follow next action while their self-quarantine period played an important role. Volunteers developed moving paths map of the confirmed cases based on text messaging from the authorities before the launch of the 10 minutes epidemiological system.

Figure : Self-quarantine Guidelines

IV. Restoration of daily life, social activities, economic growth, industrial flow and international commerce suspended by COVID19

The picture shows the data hub of Smart City Business Group in KAIA, built on Lighthouse' Signals Repository, which is one of the data and analytics methodologies of KPMG. Lifestyle spectra such as commerce portfolio, medical history, economic activities and social activities leave digital data traces throughout the life cycle of human life.
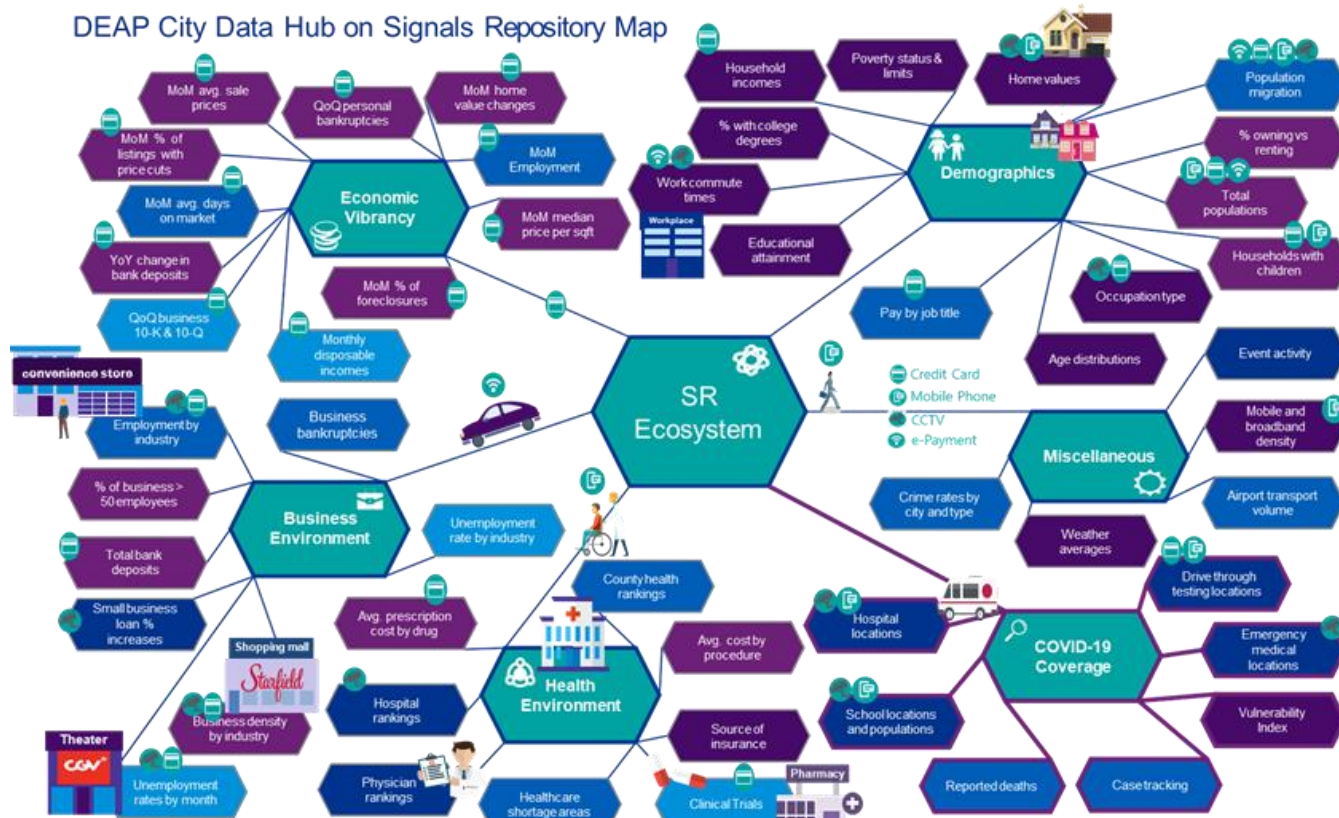

Figure : Epidemiology Supporting Data Hub for Contributing to Better Lifestyle and Lifecycle Experience

IV. Restoration of daily life, social activities, economic growth, industrial flow and international commerce suspended by COVID19

To predict its progress, the impact of current COVID19 on each industry must be observed in depth. For each industry, we encounter scenarios such as Hard Reset, Surge, Transform to Re-Emerge, Modified Business as Usual, and more.
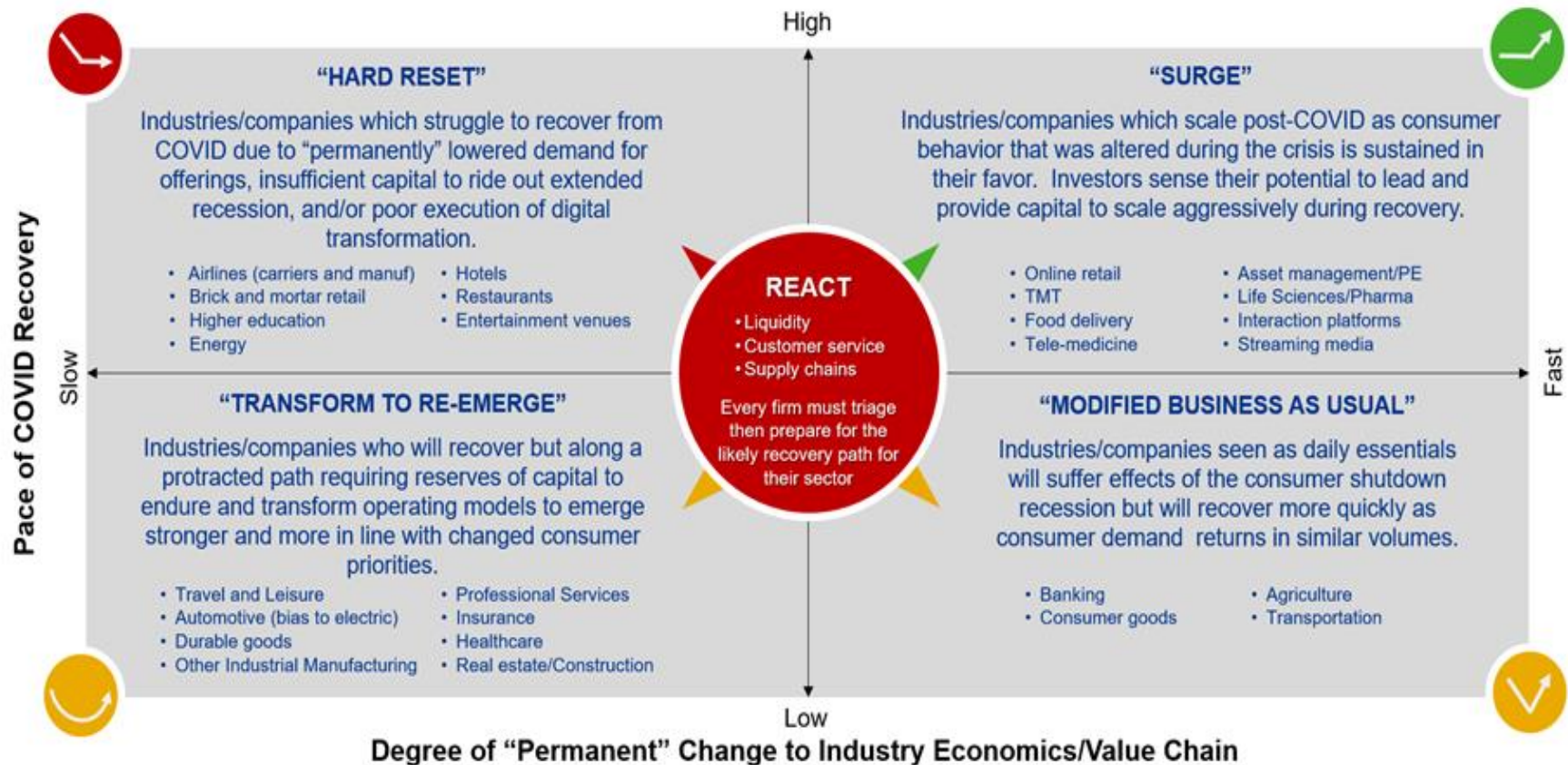

"HARD RESET"

Industries/companies which struggle to recover from COVID due to "permanently" lowered demand for offerings, insufficient capital to ride out extended recession, and/or poor execution of digital transformation.

- Airlines (carriers and manuf)
- Brick and mortar retail
- Higher education
- Energy
- Hotels
- Restaurants
- Entertainment venues

"SURGE"

Industries/companies which scale post-COVID as consumer behavior that was altered during the crisis is sustained in their favor. Investors sense their potential to lead and provide capital to scale aggressively during recovery.

- Online retail
- TMT
- Food delivery
- Tele-medicine
- Asset management/PE
- Life Sciences/Pharma
- Interaction platforms
- Streaming media

REACT
- Liquidity
- Customer service
- Supply chains

Every firm must triage then prepare for the likely recovery path for their sector

"TRANSFORM TO RE-EMERGE"

Industries/companies who will recover but along a protracted path requiring reserves of capital to endure and transform operating models to emerge stronger and more in line with changed consumer priorities.

- Travel and Leisure
- Automotive (bias to electric)
- Durable goods
- Other Industrial Manufacturing
- Professional Services
- Insurance
- Healthcare
- Real estate/Construction

"MODIFIED BUSINESS AS USUAL"

Industries/companies seen as daily essentials will suffer effects of the consumer shutdown recession but will recover more quickly as consumer demand returns in similar volumes.

- Banking
- Consumer goods
- Agriculture
- Transportation

Pace of COVID Recovery — Slow / Fast

High / Low

Degree of "Permanent" Change to Industry Economics/Value Chain

Table : Sector-specific Reaction Strategy and Prospectus for Growth

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Thank You

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