Ph.D. Dissertation of Urban Planning

Digital Urban Infrastructure and Mobile Bodies

- QR Codifying Practices during Covid-19 Pandemic in Seoul -

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– 코로나19 유행병 시기 QR코드 생산 활동과 공간 구성에 대한 연구 –

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Abstract

This thesis studies the assemblage of Electronic Entry Register (EER) as digital infrastructure during covid-19 pandemic in the city of Seoul. Electronic Entry Register is a spatial planning and strategy that the South Korean government developed to control the circulation of mobile bodies as a response to the pandemic. This case study adopts an assemblage thinking to reveal how the EER came into being. It particularly highlights the data-producing human actors by adopting a posthumanist approach, to bring them forward as one of the main actors in materialising this assemblage.

Examining the development processes of the EER revealed that assembling the 'circulatory conduit' (Deleuze & Guattari, 1997) depended largely on creating a population of docile bodies (Foucault, 2020) who were willing to, and capable of producing the right kinds of data. For this end, the South Korean government chose to simulate the national population on commercial mobile apps; which leaves the question that perhaps the task of creating a networked population is too often taken-for-granted in the discourse of smart city. Three critical dimensions in the production of digital infrastructure are proposed: the urban screens, the posthuman performances, and the leveraging effects of digital technology.

The data-producing mobile bodies became the most critical actor in assembling the EER. Field research conducted at the sites of the EER across the city of Seoul, revealed that the mobile phone numbers intimately entangled to the mobile bodies (Barns, 2020) became the most critical 'dividual' (Deleuze, 1992) that indicated the mobile bodies. The illegibility of the QR codes and the invisibility embedded in the processing of digital data alienated the very producers; raising a sense of alienation which accompanied feelings of anxieties, doubts and powerlessness. Findings on their differentiated posthuman bodies and their sense of alienation indicated that they were anything but the homogenous 'smart citizens' as often imagined in the smart city discourse.

Lastly, the thesis discusses the spatialities entailed in the QR codified urban space in two dimensions: spatial order embedded in the EER and spatial shifts experienced by the citizens. Spatial order embedded in the EER are discussed as 'fragmented circulation', 'data-based public space', and 'invisible enclosure'. Spatial shifts encountered by the citizens are discussed as 'collapsed linearity', 'liquid boundaries', and 'reproduction of digital speed'.

The core element in mobilising this urban assemblage was the data-producing docile bodies moving across the urban space with the smartphones as their prostheses. As Lefebvre

(2013) asserts that time-space is produced through practice, these bodies reproduced the digital speed onto the urban landscape. This case study highlights digital mediation in urban space where it emerges *through* the body-smartphone. It proposes that the study of digitally mediated cities, including smart city discourse, could more productively take the posthuman body a valid unit of analysis.

Keywords: urban assemblage, digital infrastructure, *dispositif*, posthumanism, smart city, mobile bodies, QR, Covid-19

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Ethical approval was obtained for all protocols from Seoul National University Institutional Review Board to confirm that this study meets national and international guidelines for research on humans. (IRB No. 2108/002-008)

Chapter 1.

Introduction

As cities all over the world are being developed and reconfigured with digital technologies, much attention is paid to the so-called 'smart city'. Smart city movement projects a particular relationship between the production of knowledge and urban management. In smart cities, the governments collect, analyse, produce and reproduce data, often in collaboration with private sectors in order to efficiently organise and manage the cities. Values created from big data, collected and processed through digital mediations, are projected to enable new ways of urban living.[1] The city of Seoul, the geographical scope of this case study, has also announced its 'Smart Seoul Network Plan (S-Net)' that would cover the whole geographical area of the capital city of South Korea with free Wi-Fi service by year 2022. It aims to become a "data-free city" in order "to guarantee its citizens' basic communication rights and prepare for an innovative smart city infrastructure."[2] Providing free online networks as an urban infrastructure through which limitless number of data are produced, circulated, and consumed, will surely impact not only the ways in which urban spaces are organised and managed, but also how the urban dwellers interact, share knowledge, and move around the urban space. Above all, digital data are to be produced by, and collected from the everyday activities of these urban dwellers.

Yet discussions on digitally mediated cities by the South Korean government and the IT corporations remain focused on developing technological solutions and future scenarios for a 'smart city'. Most of academic works published in the country do not escape such presumptive construction of the smart city and tend to remain as reactions to the discourse[3], varying in the degrees of agreement and disagreement: Park & Yoo (2017) discuss implications of the monopolistic access to data by the state and the corporations. Dho (2017) theorises the concept

1 Smart cities are being built both in developed cities and developing cities. Singapore, Oslo, Amsterdam, Copenhagen, London, and Vienna are focusing on the urban agenda of sustainability and governance under the name of smart cities. India and China are approaching smart cities as national programmes for urbanisations. China claim to have 500 smart cities ready or under construction by 2019 and India aims to build 100 smart cities by 2023.

2 Smart City Korea (2020) 'City of Seoul Launches Smart Seoul Network (S-Net) Advisory Committee', https://smartcity.go.kr/en/ , Accessed on 5 May 2020

3 Anna Munster (Munster, 2006) discusses Deleuze & Guattari (2004)'s concept of 'machinism' to point out that social concepts such as 'information age' (or 'smart cities') are only certain concretization or actualisation from endless possibilities of technological assemblages. She reminds that there still are potentials for other formations of digital culture other than the "control society" ordains. (Munster, 2006: 36-37) Her reflexive argument opens the door for imagining digitally mediated urban spaces other than 'smart'.

of smart city with Foucault's concepts of power and control. Kim, H. J. (2017) discusses democratic potentials of smart cities where citizens are empowered by smart knowledge production.

In the academic sphere of the West, and especially in the field of digital geography and urban studies, a significant body of work has been paying attention to the fundamental changes in urban spatialities transduced by digital technologies. In this body of work, digitally mediated urban space is theorized as the agency, the 'technological non-human' that produces new spatialities. It has been defined as 'code/space' (Kitchin & Dodge, 2011); 'digiplace' (Zook & Graham, 2007); 'augmented reality' (Graham, M., Zook, & Boulton, 2013); 'mediated spatiality' (Ash, Kitchin, & Leszczynski, 2018). Although this body of work has made a positive contribution in highlighting the need to rethink the urban as constantly reconfigured through new technologies, the problem is that human actors are largely imagined here as passive counterparts or supplements to the grand structure of the urban, acting in accordance with the self-structuring and autopoietic urban space. While there are differences among these scholars in their approaches, the overriding presumption is that human activities are increasingly determined by urban environments empowered by digital softwares, which impose programmed actions upon the humans. When human actors *do* get accounted in this body of work, it is often "in the form of excessive resistance to the agency granted to the digital."[4] (Rose, 2017: 779) Criticising such undertheorization of human agencies in the studies of digitally mediated cities, Rose (2017) proposes to study them as posthumans emerging and "mediated through technics and diverse." (Rose, 2017: 779) Posthumanist perspective is critical in this proposition[5] as it situates the agency as "always already constituted with technologies." (Rose, 2017: 779) Rose also highlights the need to attend to the

4 Rose exemplifies that artworks and projects (e.g. public art using digital screens) have been the main subject matter in studying human 'resistance' in digitally mediated urban space. She argues that "these persistent invocations of human agency as excessive to – that is, distinct from – the agency of digital technologies run the risk of reviving the humanist figure that posthumanist work of whatever stripe has correctly sought to challenge." Indeed, the human agencies most often "coded as masculine, white, and straight […] as universal genius" in this body of work "risks reviving precisely that sovereign human subject that posthuman theory aims to unseat." (Rose, 2017: 783) It is therefore important to properly situate the human agencies living in digitally mediated cities, not as distinct or separate from the digital technologies but intricately entangled (Barns, 2020) to them. Their posthuman agencies emerge through their actions of digital mediations to co-constitute the digital urbanity.

5 Cultural posthumanism as a theoretical perspective is more fully discussed in Chapter 2. It acknowledges that technologies, such as the hammer or the smartphone, have always been the essential components of what we call human. Technologies extend the capabilities of human bodies that "it makes little sense to conceive of either humans or technology without reference to the other." (Kitchin & Dodge, 2005: 169)

differential capacities to exercise agencies in the processes of the digital mediations. Again, the differences within the posthumans *emerge* through these processes.

This thesis attempts bring back the *relational* perspective in order to investigate the becomings of the urban and study their complexities. For this, it brings in an assemblage thinking and a posthumanist approach in particular, to reposition the relations between the body and the tool, between the space and the body-tool, and between the body-tool and other actors. They open the door for studying today's digitally mediated urban space as it allows conceptualising data-producing human actors who directly interact with the various digital surfaces (e.g. digital screens, interactive walls, smart boards, augmented realities) of the cities to create effects. These tool-using (or smartphone-holding) human agencies themselves can become a crucial site *through* which the digitally mediated spaces emerge.

1.1. QR Codifying Practice during Covid-19 Pandemic in Seoul

Since the first confirmed case of the novel corona virus[6] on 20 January 2020 in the country, the South Korean government has been implementing the tracking and tracing policy. Without an official lockdown, the country has managed to keep its mortality rate relatively low[7]. From the beginning, technology played a vital role for tracking the infected. The government, for example, collaborated with mobile telecommunications companies for retrieving geo-data from the Global Positioning System (GPS) embedded in mobile phones; it tracked the debit and credit card transactions for locating their movements of across the cities; it followed up with the Closed-Circuit Television (CCTV) footage[8]. Such coordinated collection of data allowed

6 Coronavirus disease, according to World Health Organization, is an infectious disease caused by a newly discovered coronavirus, transmissible primarily through saliva. World Health Organization (2020) 'Corona Virus'. https://www.who.int/health-topics/coronavirus#tab=tab_1 , accessed on 19 November 2020

7 While there are many factors at play in the transmission of infectious disease, the country has recorded by far much lower proportion of death toll compared with many European countries. For example, comparing with England with population of 55,980,000 people (as of 2018) which has a death toll of 46,301 persons, South Korea with population of 51,640,000 people (as of 2018) has a death toll of 496 persons as on 19 November 2020.

8 As in 2010, an average South Korean is captured by public and private CCTVs 83.1 times per day and every 9 seconds while travelling. Statistics referenced from National Human Rights Commission (2010) https://www.index.go.kr, accessed on 18 February 2021. Frequency of capture by CCTV is assumed to have increased more than threefold by 2021 because the number of public CCTVs nationwide has increased from 309,227 in 2010 to 1,148,770 in 2019. (Statistics Korea, published on 11 May 2020, https://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=2855, accessed on 18 February, 2021)

the government to identify infected individuals, notify those who had been in proximity with the infected, and to request them to self-isolate and be tested on the virus.

On 31 May 2020, the Minister of Health and Welfare announced an introduction of a system called 'Electronic Entry Register' (hereafter referred to as the EER)[9] which based its operation on the QR code technology, in order to deal with the worsening situations of the pandemic[10]. Around that time, infected cases started to emerge not only from the 'hot-spot' events (e.g. outbreak from secretive religious sect in the city of Daegu in February 2020) but also from everyday activities in the local communities. The decision to mandate the EER came straight after the authorities failed in tracking the visitors to a nightclub in the city of Seoul in May 2020 – which resulted in a large-scale outbreak – due to false and incomplete handwritten entry registers. The EER was announced to be implemented from 10 June 2020 on some eight types of 'high-risk' venues: clubs, karaoke halls, karaoke bars, date bars, bistros, no alcohol dance clubs, indoor gyms and indoor standing concert halls[11]. The practice soon expanded to venues other than these eight types of 'high-risk' venues to include cafés, restaurants, museums, libraries, hospitals, churches, theatres, film festival gates and tour buses, to mention a few examples.

QR code, abbreviation from Quick Respond code, is a kind of crypto-code that stores data which can be fast read off by imaging devices for the purposes of tracking, identification, and management. The technology was invented in Japan in the 1990s for logistics of tracking components in car production. Compared to a standard barcode, which can only hold up to 43

9 Electronic Entry Register was later also branded as 'KI Pass' (Korea Internet Pass). This thesis chooses to use the terminology Electronic Entry Register as it is far more frequently used.

10 According to Article 76-2 of 'Infectious Disease Control And Prevention Act' of Korean statutes, if necessary to prevent infectious diseases and block the spread of infection, the Commissioner of the Korea Disease Control and Prevention Agency may request the heads of relevant central administrative agencies, the heads of local governments, public institutions, medical institutions, pharmacies, corporations, organizations, and individuals to provide the following information concerning patients of infectious diseases, etc. and persons suspected of contracting infectious diseases, and persons in receipt of such request shall comply therewith (latest amendments was made on 11 August 2020): (1) personal information, such as names, resident registration number, addresses, and telephone numbers (including mobile phone numbers); (2) prescriptions prescribed and medical records; (3) records of immigration control during the period determined by the Commissioner of the Korea Disease Control and Prevention Agency; (4) other information prescribed by Presidential Decree for monitoring the movement paths of such patients, etc. Figure 20 in Chapter 4 shows the continuous changes in the regulatory decisions made on the use of the EER throughout the course of the pandemic within this highly flexible legal boundaries.

11 Translated from Korean terminologies by the researcher as the following: clubs [유흥주점], karaoke halls [노래연습장], karaoke bars [단란주점], date bars [헌팅포차], bistros [감성주점], no alcohol dance clubs [콜라텍], indoor gyms [실내집단운동] and indoor standing concert halls [실내스탠딩공연장].

numeric characters, the QR code can hold up to 2,500 numeric characters with enough capacity to store information such as names, locations, addresses and websites. According to a report submitted by the Ministry of Health and Welfare, the EER was being used in 318,000 facilities across the country (as on 21 October 2020). While the QR code as a form of digital technology had always been widely used for quite some time for commercial, educational and administrative purposes, such obligatory nationwide usage is unprecedented. What is also distinctively different in this case is that the citizens are requested to spontaneously *produce* the QR code on the spot, rather than merely to read off the pre-made QR codes for consuming information (as it had been in most cases previously).

QR code practice is also becoming a global phenomenon. Since the outbreak of covid-19 pandemic, countries like China, UK, France, South Korea, Israel, Singapore and Qatar have adopted the QR code technology as a tool to track the health status of their citizens and their movements. In the UK, designated venues in certain sectors must display NHS (National Health Service) QR code posters. Visitors to these venues must use the NHS COVID-19 app to check in when they arrive.[12] Singaporean government also asks people to voluntarily scan the QR codes in public spaces for tracking. Taiwanese government enforces phone-location tracking for quarantines and issues GPS-enabled mobile phones for those who do not own one.[13] The Israeli government was opening shopping malls and museums (as on 19 February 2021) with the QR code-based 'Green Badge' system that allowed access to only people with a certificate of vaccination.[14] China's Health Code system collects geolocation data and financial transaction histories to classify people's contagion risks in colour-based QR codes of green, yellow, and red[15]. Chinese president Xi Jinping called on countries across the world to adopt a global QR code system in order to track and speed up international travel during the

12 NHS 'Create a Coronavirus NHS QR Code for Your Venue', https://www.gov.uk/create-coronavirus-qr-poster, accessed on 19 February 2021.

13 Timberg & Harwell (2020) 'Government efforts to track virus through phone location data complicated by privacy concerns', 19 March 2020, Washington Post. https://www.washingtonpost.com/technology/2020/03/19/privacy-coronavirus-phone-data/ , accessed on 7 July 2021

14 Kershner (2021) 'As Israel Reopens, Whoever Does Not Get Vaccinated Will Be Left Behind', 18 February 2021. New York Times. https://www.nytimes.com/2021/02/18/world/middleeast/israel-covid-vaccine-reopen.html , accessed on 19 February 2021

15 For more detailed accounts refer to Kim, Y., Chen & Liang (2021)

pandemic[16]. Indeed, covid-19 pandemic appears to have "turbocharged the QR revolution […that] connect the digital world to the physical."[17]

The following is an explanation provided by the South Korean government of how the QR code should be produced, processed, stored and retrieved in the EER (Figure 1). The system requires visitors to an urban venue to first log into a mobile app – for example, the Naver and Kakao Talk[18] – to produce the one-time QR code. The QR code contains a hyperlink to the location where the customer's mobile phone numbers are stored in the servers of these platform providers[19]. Once the QR code is generated on the smartphone screen, it is then scanned by the designated screen located in the venue. These can be any networked smart device (e.g.

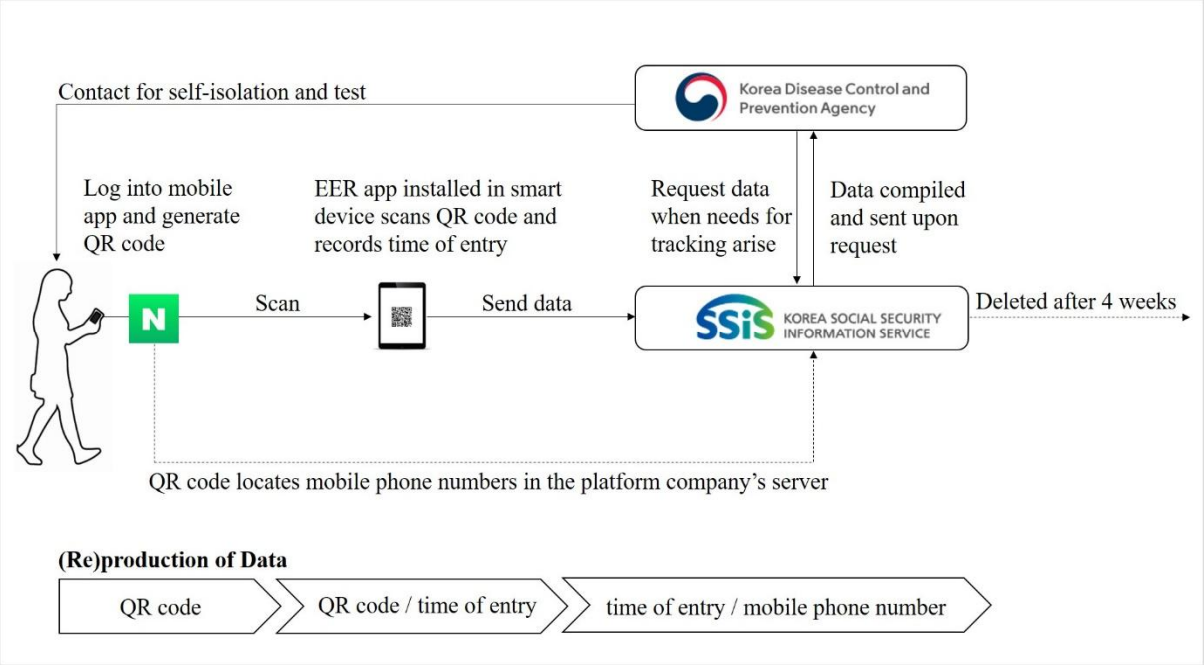


Figure 1. Flow of digital data production and dissemination in the Electronic Entry Register as explained by the government

16 Embury-Dennis (2020) 'Coronavirus: China Calls for Global QR Code System to Track International Travel amid Pandemic', 23 November 2020, Independent. https://www.independent.co.uk/life-style/gadgets-and-tech/coronavirus-china-qr-code-system-international-travel-xi-jinping-g20-b1760434.html, accessed on 19 February 2021

17 Silverberg (2021) 'How Covid Turbocharged the QR Revolution', BBC. https://www.bbc.co.uk/news/business-55579480 , accessed on 19 February 2021.

18 Naver and Kakao are the biggest digital platform corporations operating in South Korea. They provide multitude of online services including online search, news portals, online shopping, blogs, chats, maps, and digital storages. The South Korean government initiated collaboration with these digital platform companies to develop the QR code service for EER.

19 It is not actually personal data that the QR code contains; it contains a hyperlink to the location in these servers where the personal data are stored. Therefore in a strict sense, the QR codes indicates the 'address' of the data.

smartphones, tablet PCs, and laptops). Once generated, the QR code on the screen remains for 15 seconds for security reasons before it can be refreshed. The government explains that once the QR code is scanned, units of data are separately managed by two different entities: Social Security Information Service[20] (data sent to SSIS are the QR code and the time of entry) and the platform provider (data are not 'sent' to them in fact, as the mobile phone numbers are already stored in their servers), only to be retrieved and compiled together when the Disease Control and Prevention Agency requests them for tracking and tracing purposes. The Ministry of Health and Welfare informs that the data get automatically deleted after four weeks. If coronavirus is found to be circulating in a venue, all people who have registered their QR codes around that specific time-space are contacted and requested to self-isolate and be tested on the virus.

As it can be inferred from Figure 1, 'where the mobile bodies and smart devices are' become where the EER is activated. This is why the mobile bodies and smart devices become the critical points of investigation in this study. Smartphones move along with the mobile bodies to become the critical means that let the bodies in and move across the temporarily enacted boundaries in the urban space during the pandemic. As the person generates the QR code on his or her smartphone screen, he or she is virtually 'logged into the space' creating a spatiality along with others who together bring the space into being (by having logged into the space). This spatiality is *both* virtual and actual[21]. In fact, it is produced virtually before it is produced actually because the mobile bodies generate the code and *then* cross the boundaries to 'mingle' together within the temporarily bounded space. Smartphone in this sense, produces a code that identifies and quantifies the mobile body. Intrinsic in this mechanism are the portability and prosthetic-ness of the devices to our nomadic bodies.

The digital device has spread rapidly around the globe in the last decade. As in 2019, it was estimated that more than 5 billion people globally have mobile phones, and over half of these were smartphones. Out of 27 countries researched by Pew Research (2019), South Korea ranks the first place in the proportion of its adult population (aged 18 years old and more) owning a smartphone. Statistically nearly 100% of the South Korean adult population own a

20 Both 'Korea Disease Control and Prevention Agency' and the 'Social Security Information Service' are affiliated bodies of organisation to the Ministry of Health and Welfare.

21 The mobile bodies holding smartphones become efficient measure in tracking the movements of the virus. The bodies are filtered at the gates to be let in as simulacra in two fold. Firstly, they are simulacra co-constituting the virtual spatiality of codes. Secondly, they are simulacra as no one can be entirely sure if he or she is not infected. The 318,000 EERs around the country produce bodies that are 'simultaneously hypertext and flesh' (Rich & Miah, 2009: 172, original emphasis)

mobile phone; 95% own smartphones and 5% own a mobile phone that is not a smartphone. Its capital city as a research field therefore, is significant as a piloting exemplary that interrogates how digitally mediated urban space emerges through circulation of data produced by smartphone-holding mobile

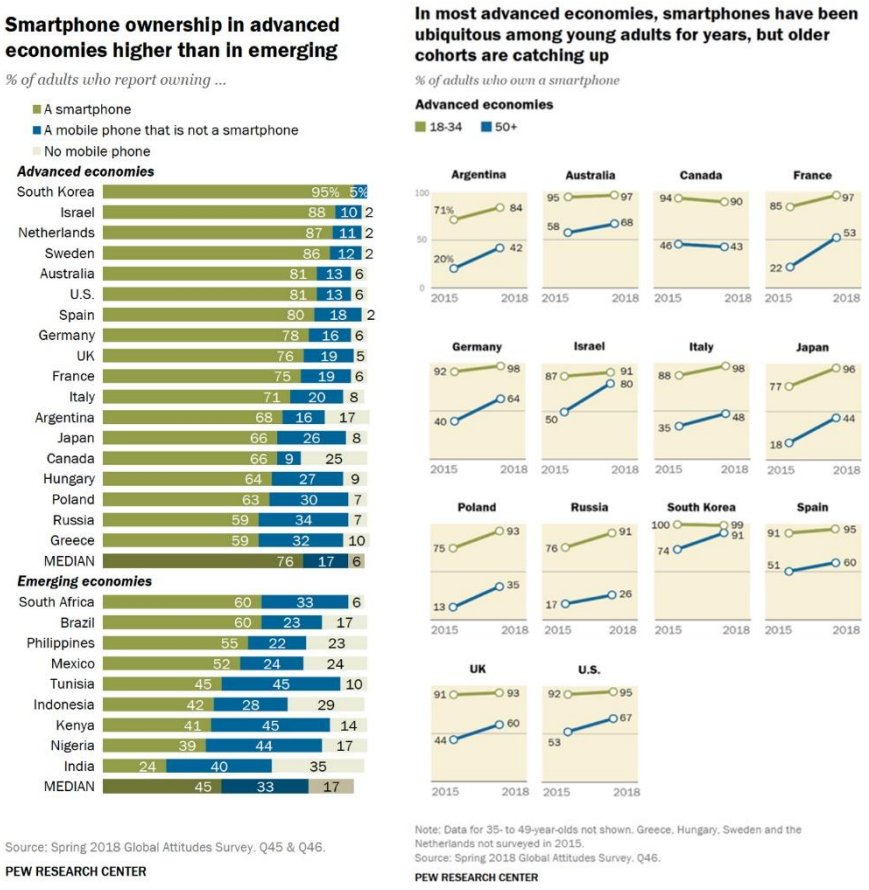


Figure 2. Smartphone ownership in advanced economies. Pew Research Centre (2018)

bodies. This particular geographical scope can indicate an urban living with high level of socio-technic potency regarding the usage of the digital device, compared to for example, cities of India, where 24% of its population own a smartphone. Particularly, compared to other countries the disparities between generations in the use of the smartphones have fast become minimal in the country. As in 2018, the proportion of younger generation aged 18-34 years old owning a smartphone was 99% and that for the older generation aged 50 years old and more was 91%. It can also be deduced that with such high percentage of smartphone ownership being 95% of the total adult population, there is not a statistically significant gendered difference in the usage of the device. The city of Seoul therefore, is a research field that does not demonstrate a conventional differences in race, class or gender in terms of smartphone ownership[22]. This

22 According to the Pew Research (2018) gender plays only a limited role in explaining differences in technological use in most countries. Whether in advanced or emerging economies, men and women generally use technology – including smartphones, the internet and social media – at similar rates.

makes the city a good site for interrogating differences that *emerge* through the digital mediation, other than those already reflected in the existing social differences.

Covid-19 is "effectively the first pandemic of the datafied society." (Milan and Di Salvo, 2020 quoted in Milan, 2020: 3) The EER should be understood within this context. It is a spatial planning and strategy based on the production of digital data about the potentially-virus-carrying mobile bodies. In this scheme, human agencies considered as potential virus carriers, are required to hold smartphones in their hands all the time in order to digitally codify themselves, contributing to the real-time knowledge production of the spread of the virus. The production of digitalised space depends on the very existence of the mobile bodies who bring the space into being, by *becoming* the digital codes themselves. It is this transitory, contingent and above all, performative character of this phenomenon which this thesis focuses on. As the latest spatial development involving digital technology, this case study is symptomatic of, and deeply entangled with the larger shifts in the production of urban space.

It should be noted at the onset that the EER is a patchwork, not a meshwork that is thrown all over the entire urban landscape. There are particular bodies and spatialities the EER aims at, which are the 'indoor spaces where unspecified nomadic bodies can coagulate'[23]. Figure 3

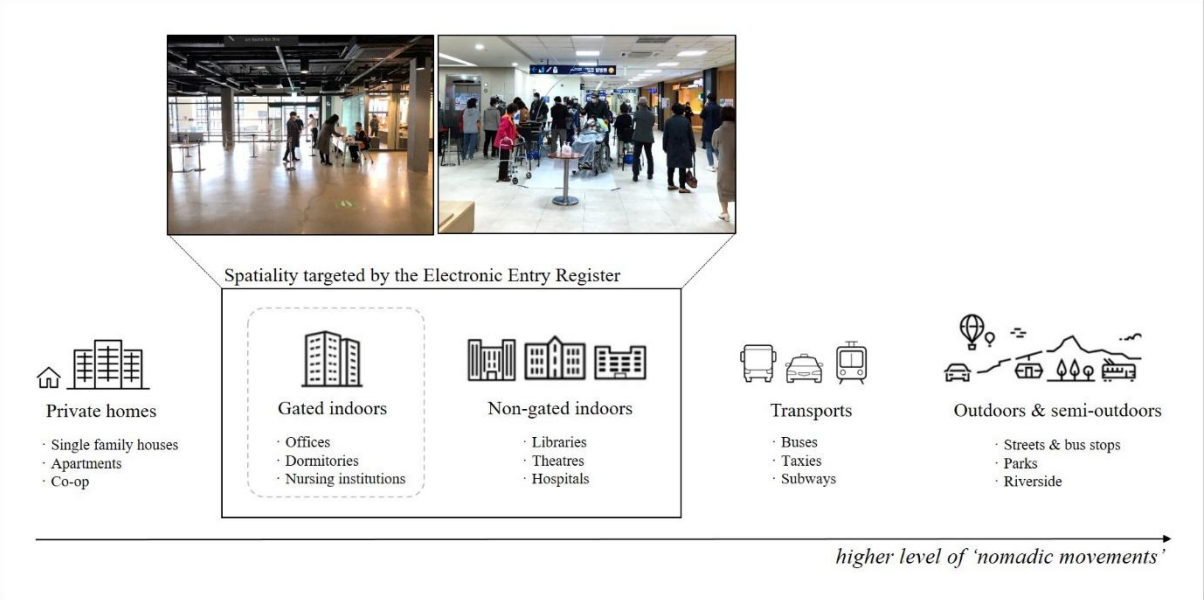


Figure 3. 'Indoor spaces where unspecified bodies congregate' become the main target urban areas for the EER.

23 The axis of 'higher level of nomadic movements' in Figure 3 refers to the level of legibility the nation state strives for in its attempts to settle the 'nomads' and make a society readable (Scott, 1998). The word 'coagulate' is used in the sense Foucault (2020) has deployed it: 'staying' for a considerate amount of time is important in this spatiality of 'coagulation' since for example, visitors to an indoor space are exempt from using the EER if they only temporarily stay (e.g. taking out foods and drinks). See 2.5 for further discussions.

illustrates this spatiality among other kinds of spatial engagements within the urban space; (from left to right) private homes are exempt from using the EER, including communal areas in apartment buildings. This is because the dwelling bodies can easily be officially identified. Following the same logic, student dormitories and office buildings which always have controlled entries with electronic cards or finger prints are also often exempt from using the EER. On the other hand, indoor spaces where unspecified masses come and go, such as the cafés, public libraries, hospitals, theatres and restaurants, are the main target places where the EER is enforced. Then again, the EER is not normally used in public transports since the mobile bodies on these vehicles almost always can be tracked by leveraging on the electronic payment systems such as the credit cards and transport cards, preferably so as not to let the linear spatiality intrinsic in the EER[24] further slowdown the movements of the mobile bodies. Outdoor spaces such as the streets, parks and the riversides cannot effectively have the EER installed. These spaces as a result, sometimes become perceived as even more 'dangerous' than indoor spaces (as discussed in Chapter 6).

1.2. Research Objective and Questions

The objective of this case study is to describe and explain the processes of reorganising the urban space with the QR codifying practices during the covid-19 pandemic in the city of Seoul. Guiding this research are the following questions:

- How was the EER as digital urban infrastructure developed, and what are its core components? (Chapter 4)
- How do the mobile bodies with the prostheses of the smartphones come to co-constitute and produce the EER? (Chapter 5)
- What are the spatial orders or constructs embedded the organisation of the EER? How is the digital mediation spatially experienced by the citizens of Seoul? (Chapter 6)
- What do the findings from this case study imply for urban studies, urban planning theories and practices? (Chapter 7)

24 Linear spatiality intrinsic in the EER is discussed in more detail in Chapter 6 (6.2.1). Intrinsic in the EER is a linear spatiality (i.e. having to scan one after the other in a queue), which often contradicts with the kinds of movements in urban venues where people move in simultaneously from different angles and in speedy manners.

Chapter 2.

Theoretical Background

This chapter begins by reviewing literature on spatial imaginations often presumed in the discourse of digitally mediated space. It problematizes the conception of digitalised urban space as 'creating *boundaries* surrounding human actors in the *background*'. To productively reposition the inquiry 'how digitally mediated spaces are actually produced', the thesis draws on *assemblage theory*. Consulting its use in the field of urban studies, the EER is contextualised as digital infrastructure, by adopting the concept of circulation and *mobile dispositif* (Wilmott, 2020) In order to interrogate how it becomes co-constituted to enact particular urban circulation, the cultural posthumanist perspective, the concept of *disciplinary space* (Foucault, 2020) and the space of *control* (Deleuze, 1992) are subsequently introduced as analytical tools for investigating the linkages between the different actors co-constituting this urban assemblage.

2.1. Problematic: Spatial Imagination on Digital Cities

The latest discourse of digitally mediated urban space reveals spatial imagination where the urban space is full of internet of things and devoid of human intervention. Rose (2017) points out that this body of works shares "a commitment of emphasizing the agency of nonhuman digital technologies" (Rose, 2017: 782). Digital technologies become *the* agencies that automate production of urban space: the invisible lines of code shape the urban landscape (Graham, S., 2005); information processing embedded in urban environment monitor and predict human behaviour (Crang & Graham, 2007); code functions as a set of laws governing how space is brought into being (Kitchin & Dodge, 2005); urban space becomes composed of software as much as the bricks and mortar (Graham, M., Zook, & Boulton, 2013); software-mediated techniques structure the possible field of actions (Klauser, Paasche, & Söderström, 2014)

While most of these works assert that human actors *should* be accounted as part of digitally mediated urban space, they clearly portray digital cities where their operations are primarily determined by the machine-to-machine conversations and through the impermeable design of digital codes and softwares. In this spatial imagination, humans are brought into the space to act according to the embedded logic of preconceived spatial structure. Explanations as to *how*

human actors take part in these mediations are overly limited. Indeed, imagining human agencies as being *surrounded* by digital technologies does not fully grasp the entanglements and complexities of digital materialisations in the urban space.

So this thesis questions, 'where exactly are the digital technologies located in the urban space?' When Crang & Graham (2007) mention "overcoding of environments", where do they exist? Are they really all "hidden in the background of the city"(Crang & Graham, 2007: 792)? Do the computerised systems connect "friction-free" and truly "blend seamlessly into the urban background"? (Crang & Graham, 2007: 792) For developing on this set of questions, this thesis draws on the *assemblage theory* (Deleuze & Guattari, 2004), and particularly on the discourse of 'urban assemblage', in order to re-contextualise this inquiry and reposition the actors and actants that are involved in the process of constituting the EER. By asking how digitally mediated urban spaces actually *come into being*, it attempts to explore a different way of imagining digital mediation in the urban space.

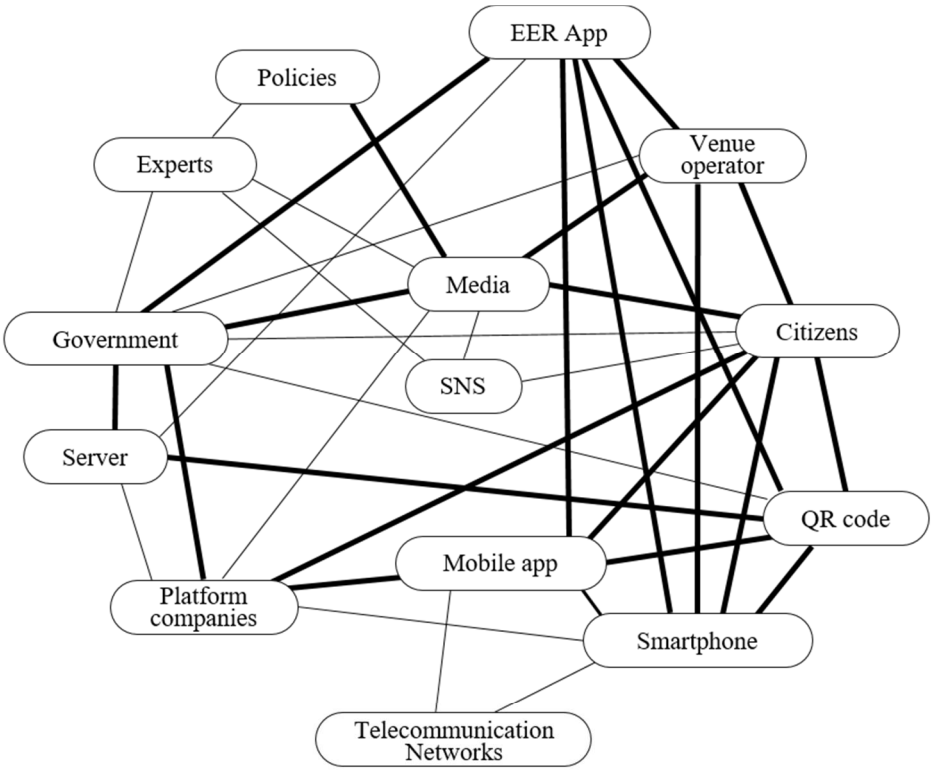
2.2. Theoretical Framework

2.2.1. Urban Assemblage

The concept of *assemblage*, originally translated from the word *agencement*[25] comes from the work of Deleuze & Guattari (2004). It refers to the process of putting together and organising a mix of heterogeneous parts – human/non-human, organic/inorganic, technical/natural – and their relational effects. New identities are generated *through* the process of assembling; therefore the whole cannot be simply reduced to sum of its parts. The concept has subsequently been mobilized in multifarious ways in different fields of studies and there has been a growing literature in the application of assemblage thinking in the field of urban studies for the last decade too. Considering its empirical, methodological and ontological potentials of the term, many in fact affirm that there is no other place better than the urban to apply the assemblage thinking; due to the nature of the urban as always in flux, made of various materials, and as "definitely constituted and powerfully constitutive." (Tonkiss, 2011: 584)

Conceiving the urban space *emerging* as relational effects of the coming together of heterogeneous elements, allows urbanists to "move away from a notion of the city as a whole

25 Its original French sense meaning 'arrangement' and 'fitting' was translated as 'assemblage' by Brian Massumi in the English version of 'A Thousand Plateaus' published in the 1987.



Components / Actors	Material	Cognitive	Affective	Social
Government				
Media				
Platform company				
Venue operator				
Citizens				
Experts				
Policies				
EER app				
Mobile app				
QR code				
Smartphone				
Telecom networks				
Server				

Monthly processes of becoming in year 2020

5	6	7	8	9	10	11	12
Development			Expansion			Maturation	

Multiple components of 'functional ensemble' delineated by Guattari (1995)

1) Material – material and energy components.
2) Cognitive – semiotic and algorithmic components (e.g. formulae leading to fabrication of machine); components of organs, influx and humours of the human body.
3) Affective – individual and collective mental representations and information
4) Social – investments of desiring machines producing a subjectivity

Figure 4. A schematic portrayal of the EER as an assemblage (top); the actors are delineated in terms of components and chronological effects exercised during the process of becoming (bottom).

to a notion of the city as multiplicity" (Farías, 2011: 369), and to make sense of the processes by which urban phenomena and urban life come into being. In particular, it is a useful lens to inquire into unprecedented urban phenomena since it approaches urban spatiality as an "ecological process" (Farías, 2011: 366, 368) Drawing attention to the "particular *urban alignments*" (McFarlane, 2011b: 654, original emphasis), it becomes a useful empirical tool that the researcher can use to develop understandings about the new phenomenon of the EER.

Figure 4 shows a schematic portrayal visualising the EER as an urban assemblage[26] constituted through the interlinkages that 'transverse' multiple actors and actants (Guattari, 1995). It is the particular 'linkages' between these actors and actants which produce the relational effects that become the EER[27]. Although as a still image it does not fully express the processes of *becoming* and the intensities of actions each actor exercises throughout the course of its assembling, the below table illustrates the constitutional effects – material, cognitive, affective, and social according to Guattari (1995) [28] – and the chronological overview indicating the relational intensities of engagements and dynamics each major actor exercised throughout the different phases under study.

Followings are explanations as to how this thesis employs the concept of *assemblage* by consulting the literatures on the assemblage thinking in the field of urban studies. Firstly, assemblage thinking allows the researcher to interrogate how different elements come together to bring about the particular socio-spatiality of the EER and illuminate its intricacies. Particularly, the mobile dimension of 'assembling' (Salter, 2013) makes assemblage thinking useful in describing and explaining "the dispositif of circulation."(Salter, 2013: 7) Assemblage embodies the dimension of mobility that is of critical importance in this case study and offers a room for moving away from the often 'bounded' connotations urban infrastructures carry.

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26 It should be noted that the whole assemblage shown in Figure 4 is not the scope of this research study. It is a schematic diagram provided to show how the EER is conceptually understood as an urban assemblage and to indicate the empirical orientation this study. The scope of the study is focused on the 'urban sites' where the data productions actually do take place. (also explained in Chapter 3).

27 This thesis distinguishes between actors and actants. It is only the actors (e.g. government, citizen) that are able to put actants (e.g. mobile app, QR code) in circulation in the system, according to the Encyclopaedia of the Sciences of Learning (2012). Retrieved from https://link.springer.com/ on 29 November, 2021. The most critical linkages in the constitution of the EER are indicated in bold lines. More details on the dynamics of this becoming will be described and explained with the findings from analyses in the following chapters.

28 Guattari (1995: 35) also talks of 'abstract' as one of the components. It installs transversally through the material, cognitive, affective and social components and layers them in particular ways ("montages" according to Guattari). Since its role is to "extract" to bring the other components into existence, it is "a sort of dynamism" which could not be quite simply accounted at the level of the actors or actants (therefore it is not denoted in Figure 4).

Assemblage also implicates consistent changes in the ways of linking, to connote "transformation, or the work of reassembling, […] the possibility of invention." (McFarlane, 2011b: 654) This disposition is particularly useful for confronting a phenomenon that involves digital technology, which by its nature interoperates and expands, always to have new ways invented along its way.

Secondly, the contribution that *assemblage theory* makes to this study lies in its implications for how *agency* should be conceived. Conceiving agency as an "emergent capacity of assemblages" (Farias, 2009: 15) prevents the researcher from "returning to the centrality of the individual" (McFarlane, 2011b: 651) in the sense of the Western personhood. This means that human actors should be defined not by their pre-given identities, but by the assemblages they join to constitute. Assemblage thinking in effect, repositions the human actors with their *productive* potential. As their agencies *emerge* in the process, researcher's attention should be paid to their *agentic role* during empirical research. This orientation sets this thesis to study the human performances as the 'working components' in their co-constitution of the EER.[29]

Thirdly, this thesis conceives urban assemblages as made by different capacities of agencies "through profoundly unequal relations of power, resource, and knowledge." (McFarlane, 2011b: 667) For this, it adopts assemblage thinking as an empirical and methodological orientation, rather than as an ontological approach which, Brenner, Madden & Wachsmuth (2011) caution against[30]. They propose that "it is essential to explore who (or what, as the case may be) is doing the structuring to whom." (Brenner, Madden, & Wachsmuth, 2011: 236) Tonkiss (2011) also warns that without theoretical contextualisation attuned to the structuration of urban processes[31], studying urbanity with an assemblage thinking is likely to generate a "template urbanism" (Tonkiss, 2011: 584) with just a "thick description." (McFarlane, 2011a) In order to study the EER as 'situated assemblages' (McFarlane, 2011a: 209), this thesis follows Brenner, Madden & Wachsmuth (2011)'s advice to adopt further theoretical tools (which are not derived internally from the assemblage approach itself) to

29 For example, the focus is on what productive (or unproductive) roles the human actors play in the constitution of the EER, not on how 'docile' (as in 'obedient', which is not what Foucault meant by the term anyway), or 'resistant' their attitudes are in their performances.

30 Brenner, Madden & Wachsmuth (2011) argue that adopting assemblage thinking as an ontological approach – as a collection of human and nonhuman actants within a flat ontology – in urban studies could deprive the researcher of analytical tools for explaining the process of assembling in question.

31 As Tonkiss gives examples, studying food industry in cities and studying urban poverty involve different kinds of power relationships in terms of their materialities, institutions and boundaries.

position its "context of the context" (Brenner, Madden, & Wachsmuth, 2011: 233) and to ground the analyses to social relations and contexts particular to the research inquiry.

Furthermore, as a case study, it needs to be defined as a 'bounded system' (Creswell & Poth, 2018) to determine which actors and actants are most relevant as part of the assemblage and which are not (Brenner, Madden, & Wachsmuth, 2011; Storper & Scott, 2016). Defining a case study as a bounded system means that one has to have a closer look at particular agencies than others. Indeed, the need for determining the scale of the analysis means that the study requires the researcher to pull out which linkages between the many actors and actants to interrogate.

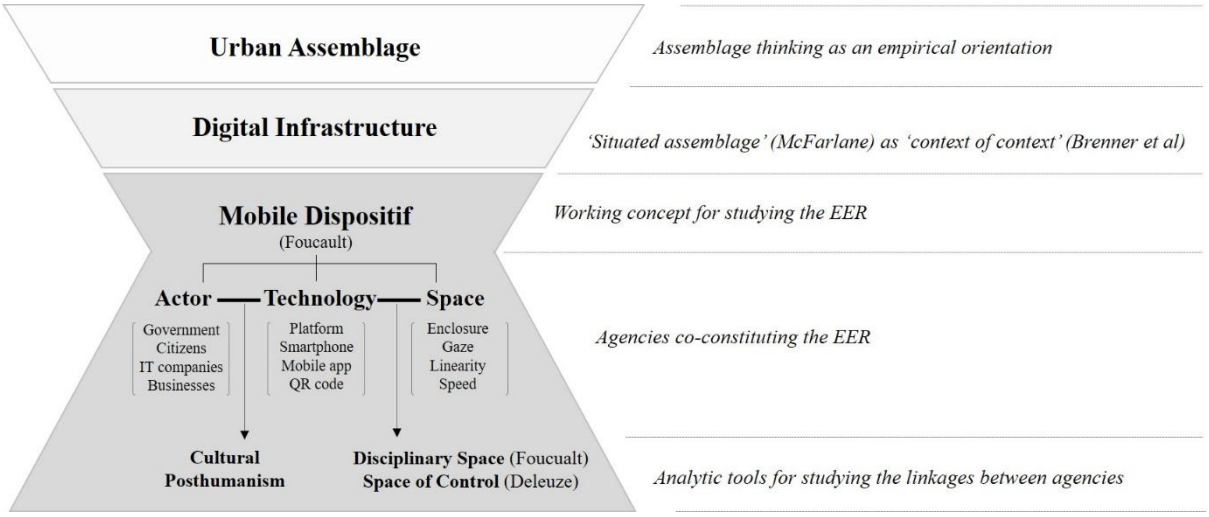

Figure 5. Theoretical framework for studying the Electronic Entry Register as an urban assemblage

Figure 5 shows the theoretical framework and analytical tools this thesis adopts to contextualise the EER. It allows the researcher to magnify and scope down the areas of investigation, and to determine the most critical linkages[32]. As the bottom part of Figure 5 illustrates, assemblage thinking provides an analytical advantage in *exposing* how operations of power are multiscalar. It is the "*interactions* between components that form the assemblage" (McFarlane, 2011b: 653, original emphasis) and it is these linkages between the actors and actants that this study focuses

32 Figure 5 is by no means to imply that the conceptual scope of *dispositif* – or mobile *dispositif* – is 'smaller' than that of the assemblage. *Dispositif* is used to highlight the particular "relations that can be established between these elements" and to underline "precisely the nature of the connection that can exist between these heterogeneous elements." (Foucault, 1980: 194) Its characteristics outlined by Foucault (1980) usefully depict the becomings of the EER, as further discussed in 2.4.

its investigations on. Specifically, *cultural posthumanist approach* becomes the analytical tool for studying the linkages between the human actors and technology. The concepts of *disciplinary space* (Foucault, 2020) and *space of control* (Deleuze, 1992) become analytical tools for studying the linkages between technology and space. It should be emphasised once again, that it is the relations between the agencies that this study intends to explore with an assemblage thinking, rather than the agents themselves (becomings of which can be of course, an interesting project of its own, but it is out of the scope of the research objective of this thesis). The remainder of this chapter explains each tier of this theoretical framework.

2.2.2. Digital Infrastructure

As briefly mentioned in the previous section, digital infrastructure provides the "context of the context."(Brenner, Madden, & Wachsmuth, 2011: 233) in this study. Larkin (2013) defines infrastructure as:

> "[…] built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space. As physical forms they shape the nature of a network, the speed and direction of its movement, its temporalities, and its vulnerability to breakdown. They comprise the architecture for circulation, literally providing the undergirding of modern societies, and they generate the ambient environment of everyday life." (Larkin, 2013: 328)

Digital infrastructure is conceptualised as built digital networks that facilitate flows of goods, people, and resources; in so doing, it produces, processes and reproduces digital data. For understanding the particular materiality of the EER as digital infrastructure, it is important to inquire what kind of 'circulation' it facilitates. The South Korean government, along with other governments globally, dealt with the double-sided issues of urban circulation since the outbreak of the covid-19 pandemic. It had to control the movements of the infected population. At the same time, it needed to maintain the circulations of people, transports, and goods which urban economies largely depend on.[33] According to Foucault, a government's role is "essentially,

33 As Braudel (1982) asserts from historical viewpoint with examples of human inventions such as the market, the city walls and the roads, the spatial structures of cities have always been constantly reformulated to facilitate circulations of resources, labour, and knowledge. Deleuze and Guattari also see the city as a 'circulatory conduit' (Deleuze & Guattari, 1997). It channels the movements of resources and knowledge while it is itself a flux and never fixed. In Security, Territory, Population, Foucault (2007) claims circulation as the essential condition of a city.

making possible, guaranteeing, and ensuring circulations." (Foucault, 2007: 29) Foucault further asserts that circulation essentially renders certain circuits possible and other circuits impossible: "it is in terms of this option of circulation, that we should understand the word freedom, and understand it as one of the facets, aspects, or dimensions of the deployment of apparatuses (dispositif) of security." (Foucault, 2007: 49)

The concept of circulation therefore encompasses both mobility and immobility. It guides the researcher to go beyond the mobility/immobility dichotomy (Salter, 2013). The EER should be understood not only as to 'block' but also to 'allow' citizens' access to urban spaces. It means that the smartphone-carrying human actors are not only filtered out at the sites of the EER but they also 'pass through' them to sustain their mobile lives during the pandemic. It 'facilitates' particular kinds of mobilities across the urban space. Indeed, as Salter (2013) points out that security and freedom are interwoven in creating the circulation, control (of mobility) and freedom (of mobility) are interwoven in creating particular circulation through the EER. They are not opposite parts of the system, but two different techniques of the same assemblage – which makes probing the power relations embedded in the EER a multi-faceted endeavour.

The EER as a circulatory assemblage does not only circulate the bodies but also produces knowledge about them. Individuals during the pandemic can be conceptually assimilated to the pathogen, or the 'case'. Yet as much as they potentially carry the virus, they also potentially do *not* carry the virus. The infected bodies become problems, whilst the uninfected bodies become solution because they can together co-constitute a virus-controlled social space. There is a clear conceptual binary imposed upon the body: infected or uninfected, problem or solution. However, in practice, no one can be sure if a person is infected or not (not even himself/herself) at the point of that mobile body crossing a boundary. This uncertainty (in fact practically no clue) as to whether or not a person is carrying the virus, becomes the point at which the QR code technology is introduced. The EER as a digital infrastructure is constructed with this aim to produce digital data which indicate the mobile bodies and their movements. As demonstrated in the following, *mobile dispositif* as a working concept guides the researcher to clarify the important elements– the bodies, technologies and the space – in this process of knowledge production.

2.2.3. Mobile Dispositif

While the concept of digital infrastructure contextualises the EER as facilitating particular circulation of mobile bodies during a pandemic, the concept of *dispositif* – or *mobile dispositif* (Wilmott, 2020) more specifically – allows the researcher to focus on the materialised anatomies of the EER at the sites across the city of Seoul. This concept guides her to probe into the particular relations and productive effects among the actors, technologies and spatial organisations that work together to produce the required digital data.

As Agamben (2009) interprets the concept of *dispositif* is closely related to Foucault's concern with the notion of 'governmentality'[34]. As Foucault (1980) explained the concept in an interview, *dispositif* refers to a "thoroughly heterogeneous ensemble" connected by relations for "a dominant strategic function" (Foucault, 1980: 194, 195). Following is an excerpt from the interview on his elaborations on the concept. (Foucault, 1980: 194-196).

> The apparatus itself is the system of relations that can be established between these elements […] what I am trying to identify in this apparatus is precisely the nature of the connection that can exist between these heterogeneous elements […] I understand by the term 'apparatus' a sort of – shall we say formation which has as its major function at a given historical moment that of responding to an *urgent need*. The apparatus thus has a dominant strategic function […] the apparatus as such is constituted and enabled to continue in existence […] because each effect […] enters into resonance or contradiction with the others and thereby calls for a readjustment or a re-working of the heterogeneous elements that surface at various points […] there is a perpetual process of strategic elaboration. (original emphasis)

By this explanation, Foucault reveals four main dimensions of *dispositif*:

(1) *Dispositif* refers to a heterogeneous ensemble. It is the result of bringing together various elements at a given historical moment.

34 Agamben (2009) finds that Foucault used the term dispostif or ('apparatus' in English) especially often from the mid-1970s when he began to concern himself with "governmentality" or the "governments of men." (Agamben, 2009: 1) First developed by Foucault himself in his later years, the term 'governmentality' can be understood as the 'organized practices (mentalities, rationalities, and techniques) through which subjects are governed'. (Mayhew, 2004)

(2) *Dispositif* is a system imposing particular relations between these heterogeneous elements in order to purse a dominant strategic function. It is the 'nature' of the connections that distinguishes *dispostif* from other kinds of heterogeneous ensemble.

(3) *Dispositif* is a strategic formation set up to respond to an urgent need. The time factor implied in this 'urgency' implies the possibilities of assembling, disassembling, and reassembling of the heterogeneous elements as necessary.

(4) *Dispositif* is yet a stabilised ensemble at least at a point in time. It continues in existence and strategically elaborates in the course of readjustments. In the ongoing process, its formation changes its shapes and strengthens its strategic power.

Not only can the concept of *dispositif* be usefully adopted as a particular kind of assemblage[35], but also the concept clearly has resonance with the becomings of the EER. The EER had

Figure 6. Concept of *dispositif* is employed to investigate the data producing practices and spatial organisations at various EER sites across the city of Seoul. Images are from the field research.

35 Also Legg (2011) in his article 'Assemblage/Apparatus: using Deleuze and Foucault' asserts that the concepts of assemblage and dispostif can be, and should be dialectically thought together. Legg suggests to productively consider dispositif as a type of assemblage. Not only do Deleuze's ideas have obvious and acknowledged indebtedness to Foucault's work through their collaborations in the 1960s and 1970s, but also Deleuze portrays "assemblages as leading to order, striation, re-territorialisation, long-term effects and scaling as much as to dis-order, smoothing, de-territorialisation, short-term effects and de-scaling […] stability is assembled as much as destabilisation." (Legg, 2011: 129, 131) This case study finds that the actual mechanism of QR code production at the 'sites' of the EER is such a kind of assembling that is stabilised by discipline to certain extent. It has successfully created in the mobile bodies the "constricting link between an increased aptitude and an increased domination." (Foucault, 2020: 138). Legg contends that assemblage and dispostif operate in a dialectical sense and this is especially so, in practice. (See Plogør (2008) and Eriksson (2005) for further

brought together different organisations, objects, bodies, and spatial designs ("thoroughly heterogeneous ensemble) for the purpose of creating a particular circulation ("dominant strategic function") in the urban space in order to fight the pandemic ("urgent need"). The EER had continued to function at least for 14 months (when the following photographs in Figure 6 were taken in August 2021) and its formation had evolved throughout the course ("perpetual process of strategic elaboration").

Following is an overview of how this thesis uses *dispositif* as a working concept for studying this particular practice of data production. They include (1) docile body; (2) normalisation; and (3) microphysics of power as 'productive'.

(1) Docile bodies

According Foucault, "[a] body is docile that may be subjected, used, transformed and improved." (Foucault, 2020: 136) He points to the significance of human body as a place upon which power can be exercised to reproduce itself. Power explores, decomposes and rearranges bodies through discipline. Discipline, comprised of a set of instruments, techniques, procedures, application, and targets, "'makes' individuals." (Foucault, 2020: 170, original emphasis) and its main objective is to 'train': "it 'trains' the moving, confused, useless multitudes of bodies and forces into a multiplicity of individual elements […]"(Foucault, 2020: 170) By breaking down different elements of the bodies, discipline uncovers the useful points of their applications and prescribes series of actions: the position, the direction, the postures and gestures of the body and the duration of each action. As a result, the docile bodies readily create certain movements to become the critical components that work up the whole system of power and make it function.

It should be emphasised that Foucault (2020) does not use the term "docile" to mean 'weak'. In fact, through discipline, the bodies are 'corrected' to have an 'aptitude' or a certain 'capacity'. Docile bodies are those that have become "a productive body."(Foucault, 2020: 26) Individuals capable of producing digital data on the move become "useful individuals" (Foucault, 2020: 211). Furthermore, this learnt aptitude in turn produces a relation of strict subjection. Discipline creates in the bodies the "constricting link between an increased aptitude and an increased

discussions on this theoretical linkage.)

domination." (Foucault, 2020: 138) Discipline involves reducing individuals into "objects of knowledge" (Foucault, 2020: 28), which requires a process of normalisation.

(2) Normalisation

Accumulating knowledge about individual bodies requires reducing them into "objects of knowledge" (Foucault, 2020: 28) through the process of 'normalisation'. The 'marks' once branded on the tortured body of the condemned in the era of scaffold, are replaced by "a whole range of degrees of normality indicating membership of a homogeneous social body". (Foucault, 2020: 184) In order to establish this "normalizing gaze" (Foucault, 2020: 184) knowledge needs to traverse all points of differences and be produced in certain formats, easy to transmit and manipulate; it requires registers, specifications, and codes to facilitate the transmission of data and "to integrate individual data into cumulative systems." (Foucault, 2020: 190)

Establishing 'codes' is therefore, the "first stage in the 'formalization' of the individual" as it transforms the individual as "an analysable object" (Foucault, 2020: 189-190). A coded individual becomes the standard unit for calculating the differences between the individuals and analysing "their distributions in a given 'population'." (Foucault, 2020: 190, original emphasis) According to Foucault, through this technique of normalisation, each coded individual becomes a 'case': the place of examination. As the individual is established into a homogenised 'case', it can be studied, measured and calculated. Coding (and digital coding in particular, for this case study) transforms subjects into objects with higher levels of measurability and calculability – which become the critical assets in the production of knowledge.

(3) Microphysics of power as 'productive'

Explaining how "political technology of the body" (Foucault, 2020: 24) gets enacted, Foucault pays attention to the microphysics of power that gets enacted on the surface between the body and the tool. As discipline is prescriptive, it defines each of the relations that the body must have with the tool that it manipulates. It prescribes how "a meticulous meshing" (Foucault, 2020: 153) between the body and the object must occur. To illustrate this, Foucault gives an example of the detailed instructions provided to the soldiers for using the rifles. The

instructions consist of breaking down the required actions into multiple steps of gestures, postures and movements: the parts of the body to be used (e.g. right hand, left hand, different fingers of the hand, knee, eye, elbow); the parts of the object to be manipulated (e.g. barrel, notch, hammer, screw); how the bodily part and the point of object are correlated according to a number of gestures (e.g. rest, bend, pull); and the succession in which such correlation occupies a particular place.

This series of bodily movements created with object, is what was called *manoeuvre* by the military theoreticians in the eighteenth century (Foucault, 2020: 152-153) A *manoeuvre* is therefore a trained performance enacted with the effects resulting from particular relations between the body and the object. The bodily movements required of an individual soldier as one marches together with others, metaphorically resemble the bodily movements required of a person who passes through the EER. As the bodies move towards the EER, their hands need to be attached to the smartphone to hold it and touch it in particular ways, to make the EER 'work' and let in the next flow of mobile bodies without much delay. In this process, microphysics of power is enacted over the whole surface of contact between the body and the tool. Foucault explains that disciplinary power becomes effective as "syntheses of such coercive link" (Foucault, 2020: 153) between the body and the tool.

Foucault (2020) emphasises the productive aspect of power. He urges not to think of power as simply negative mechanism that is only repressive, preventive, eliminatory, and exclusionary. Foucault highlights the need to situate power in its positive effects because "power produces; it produces reality." (Foucault, 2020: 194) As it was also emphasised when discussing the *agentic role* in assemblage thinking, the human agency in this *dispostif* should be translated in terms of their *productive* potential in the materialisation of the EER. Developing on Foucault's concept of *dispositif*, Wilmott (2020) proposes the concept of *mobile dispositif* to emphasise the fluidity of such assemblage. It highlights the 'mobile' nature of the ways in which the elements converge in the production of a regime, "where specific technologies, objects, rules, conditions and infrastructures exist to facilitate that moment." (Wilmott, 2020: 31) As it reflects Thrift (2014)'s assertion that everything and everyone today need be understood as 'mobile', the concept of *mobile dispositif* is particularly relevant for conceptualising the fluid coming together of the various mobile bodies and objects necessary for materialising the EER. Momentarily enacted, the EER becomes the movable node shaping the flow of circulation during the pandemic.

Particularly relevant is Verhoeff (2017)'s attention paid to the roles of the 'urban screens'. Verhoeff (2017) explains that *mobile dispositif* in today's urban space is ultimately a screening arrangement. Urban screens determine both the physical set-up for interaction and enact 'places' where agents meet and communicate. As such, the author asserts that the media interfaces should be understood as *process*, rather than objects. Munster (2006) also understands interface as the very critical site that brings together the co-operation of the device's specifications (hardware), the applications' affordances (software) and the user's actions (interface). As the field research is to reveal, it is exactly this coming together of the hardware, software and actions that create the urban assemblage at the sites of the EER across the city of Seoul. Adopting *mobile dispositif* as a working concept guides the researcher to investigate the anatomy of the EER by paying attention to its materialities, situatedness, and ephemerality.

2.2.4. Assembling the Electronic Entry Register

As both Figure 4 and Figure 5 suggest, power relation is 'plural' (Farías, 2011). This preposition is also congruent with Foucault's emphasis on microphysics of power that each agency in the assemblage should be seen to be linked to the "positive and useful effects."(Foucault, 2020: 24) Although unequal, such understanding of power as is significant. Indeed, it is too simplistic to regard the EER as a system entirely 'imposed' upon citizens because as a democratic society, it is not possible to push a policy with sociocultural prepositions that are outside the acceptable range of everyday consciousness and understanding. In other words, the very fact that the EER was proposed to the citizens by the government to start with, demonstrates that the citizens as actors had the "latent capacities" (Kamalipour & Peimani, 2015: 406) to create the linkages that bring the EER into a social reality. Indeed, urban policy is assembled not just through structures of domination, "but through particular atmospheres of reception"; in the end, the EER lied in the "crucial domain of the possible." (McFarlane, 2011b: 652)

In order to delineate the processes of assembling the EER, this section outlines the analytical tools for probing the linkages between the 'actor and technology' and the 'technology and space' (Figure 5). For the former, the *cultural posthumanist approach* becomes the major source of reference. For the latter, Foucault (2020)'s concept of *disciplinary space* and Deleuze (1992)'s updated concept of *space of control* are employed for interrogating the relationships between technology and spatial organisations.

(1) Actor–Technology

A posthumanist perspective questions the often taken-for-granted assumption of distinctive boundaries between the human and nonhuman and examines how these boundaries are constantly stabilised and destabilised (Barad, 2003).[36] The posthuman turn was fully enacted by feminist theorists in the 1980s-1990s. In particular, through Haraway (1985)'s cyborg, the boundaries between the human and nonhuman, technology and the self were dismantled. Technology was investigated "precisely as a mode of revealing." (Ferrando, 2013: 29) Cultural posthumanist perspective acknowledges that since the Palaeolithic era, technologies have been essential components of what we call human. By holding a hammer or a smartphone in one's hand, the body is extended physically and psychologically, to perform with a stronger force or go virtually further in distance. Technologies have always extended the capabilities of human bodies that "it makes little sense to conceive of either humans or technology without reference to the other." (Kitchin & Dodge, 2005: 169) In the contemporary era, this dynamic is "intensified as the time required to effect change compresses and technologies become more pervasive and interconnected" (Hayles, 2006: 160)

Posthuman agency in this thesis is defined as the human actor who performs with his or her smartphone in order to gain 'freedom of access' across the urban spaces during the covid-19 pandemic in Seoul. They are posthumans in two fold. First, they are potential virus-carriers. They are, from a biological angle of the posthumanist approach, potentially attached to the other species of the novel coronavirus. This aspect is particularly important because all over the world, the posthuman bodies carrying the coronavirus or the so-called 'cases', are used to determine the degree of the spread of the pandemic in quantitative terms. Indeed, such "counting [is] broadly defined as a way of knowing about the virus." (Milan, 2020: 1) Posthumans of this kind cannot be determined easily though, because of the invisibility of the virus; which in turn, lead to the introduction of the QR code that normalise (Foucault, 2020) the bodies. The bodies are thus corrected in the second kind of the posthumans with the 'enhancement technologies' (Hogle, L., F. , 2005) of the smartphone.[37]

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36 Posthumanism as a philosophical approach has travelled down to encompass a wide range of scholarships – including ecology, feminist studies, science studies, sociology, and information studies – to alter our understanding of what counts as human. Out of seven definitions of posthumanism Ferrando (2013) provides, the discussions of posthumanism in this thesis centres on Cultural Posthumanism. It focuses its questions on the historical notions of 'human' and 'human nature', challenging typical notions of human subjectivity and embodiment. Technology becomes one of the critical embodiments.

37 The expected level of prosthetic-ness in the covid-19 pandemic is well illustrated in the example of '"Self-Quarantine Safety Protection App' developed by the South Korean government. It tracks and monitors people under home isolation with the technology of real-time locations (different from the one used for the EER). When people attempted to deceive or

This thesis also points out the importance of recognising that today's posthuman actors with the smartphones as their prostheses, do *write* the digital codes. In this regards, Gilbert Simondon (1924-1989)'s concept of 'margin of indeterminacy' as interpreted by Mackenzie (2019) is useful. It proposes to understand technologies as "processually, that is, as *events* rather than objects, as contingent the whole way down […]" (Mackenzie, 2003: 4, original emphasis) What marks contemporary technological engagements particularly different from previously is that we are increasingly involved in the realm of *writing* the code as text.[38] When a person touches to open a menu on her smartphone screen, she is effectually writing a code as a text to be executed by the object being touched. This is the point at which the "meticulous meshing" (Foucault, 2020: 153) occurs. The scope and scale of today's digital technologies in embracing human performances have greatly expanded. Therefore, thinking about digitally mediated cities should embrace this change too, and probe how the posthuman bodies may in fact be linked to the production of urban space through their agential performance[39].

It should be noted at the onset that technological 'mediation' as a concept is to be sustained in this thesis, in spite of Barad (2003)'s proposal of rejecting the idea. Barad suggests that for examining posthuman practices, the term 'mediation' should be rejected. Emphasising the 'exteriority within', the author argues: "[t]he ubiquitous pronouncements proclaiming that experience or the material world is "mediated" have offered precious little guidance about how to proceed. The notion of mediation has for too long stood in the way of a more thoroughgoing accounting of the empirical world." (Barad, 2003: 823) Barad asserts to reformulate the emergent boundaries of the body in the way it positions the tools as being attached to, or included in the body, so that the boundaries conceptually incorporate both, constituting what the author calls the 'agential cut'[40]. The author points out the conceptual inefficiency of the

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sidestep the apps by going outside of their homes without their smartphones, the government immediately updated the app to sense human motion, which sets off an alarm when it senses that the smartphone has been left inactive for two hours.

38 Smart devices are 'smart' not only because they have the capacities for accessing and retrieving multiple resources through networks but also because they adapt to the different users' demands in the forms of texts written by them.

39 There is a growing literature on how posthumanist approach can open the door for new ways of imagining the urban. Rose (2017) uses posthumanist approach as a way of overcoming under-theorisation of human agency in the studies of digitally mediated cities; Shaw (2018) questions the relationship between the production of urban space and the technologically embodied bodies, to propose a posthuman politics that re-imagines and re-purposes the urban; Ibrahim (2021) critically questions the phenomenon of data economy that is inextricably bound to the posthumans in the age when the digital reconfigures our consciousness, subjectivity and living conditions; Jon (2020) calls for planning theorists to develop a posthumanist approach to planning, to see citizens as active agents that influence how cities are planned and designed, especially in the context of the Anthropocene and planetary environmental degradation.

40 Barad explains this concept of 'agential cut' by taking insight from Niels Bohr's philosophy-physics of quantum theory to argue that theoretical concept such as 'position' cannot be presumed to be an abstract concept but "specific physical

hyphen in 'body-tool'. However, Barad's conceptualization of tools as completely permeated into the body risks neglecting the possibilities that linkages between the body and the tool could create 'frictions' (Rose, 2016a). Also the kinds of frictions could take different forms depending on the kinds of bodies and the ways in which they are mediated. Indeed, Rose (2017) points out the need to take into account the diverse forms of posthuman actors with differential capacities to exercise agency. Therefore, Barad's rejection of the notion of 'mediation' is held as a hypothetical proposition, which will be discussed later *with* the results of this case study.

(2) Technology – Spatial organisation

This section discusses Foucault's concept of *disciplinary space* followed by Deleuze (1992)'s reinterpretation, *space of control*, as analytical tools for examining the linkages between technology and space (Figure 4). Deleuze updates Foucault's concept in order to capture the shifts in the exercise of power in contemporary societies that increasingly operate on the logics of information and communications technology. Quoting Foucault (2020)'s own words, Deleuze points out that different shapes of power (e.g. sovereign, discipline, control) transiently co-exist at any time. As such, the researcher uses the two concepts in complementary manner for interrogating the spatial organisations at the sites of the EER.

Disciplinary space

Foucault (2020) articulates characteristics of disciplinary space produced by docile bodies. In *disciplinary space*, irregular bodies and movements are redistributed to enact particular spatial relations: "it arrests or regulates movement of individuals wandering about the country in unpredictable ways and establish calculated distributions." (Foucault, 2020: 219) One critical mechanism for this spatial organisation is creating "bodies that can be individualized." (Foucault, 2020: 208) Another is utilization of time. Discipline prescribes actions in detail, and for this, it capitalises time to break up and rearrange activities: "the division of time became increasingly minute" as "precise applications are […] the fundamental virtues of disciplinary time." (Foucault, 2020: 150-151) Time is rearranged so that microphysics of power can intervene more regularly and more precisely. Individualised bodies distributed within linear

arrangements." (Barad, 2003: 814, Barad's emphasis)

organisation of time produces an 'analytical space', characteristics of which are discussed by Foucault, as following.

Firstly, it requires *enclosure*. As it aims to establish presence and absence of individuals, to locate them and to supervise the conduct of each at any moment, it needs to surround and enclose them. It cannot risk disappearance and their "dangerous coagulation." (Foucault, 2020: 143) It is to "render visible those who are inside it." (Foucault, 2020: 171-172) Such visibility is one-sided as it is the "eyes that must see without being seen." (Foucault, 2020: 171) Central to the spatial organisation of the Panopticon invented by Jeremy Bentham is the gaze that is alert everywhere. It is the fact of being constantly watched in an enclosed space that assures power is exercised over them.

Secondly, disciplinary space is partitioned. The partitioning regulates the comings and goings of "mobile, swarming mass" (Foucault, 2020: 144). Foucault gives an example of Rochefort, a military port in France. As a port, it is functionally designed to partition different bodies, goods, and objects in order to secure certain flows. It is important to note that the effects of partitioning is not only segregations, but also segregated 'movements'. Disciplined docile bodies follow through the partitioned lines to enable particular kinds of circulations. 'Urban screens' (Verhoeff, 2017) that instigate "dematerialization of architecture" (McQuire, 2006) can also be understood with this concept as they rearrange space to create certain movements and interactions.

Thirdly, discipline organises a serial space. The place one occupies is classified into a *rank*. The linear or 'evolutive' time aiming for a terminal and a progress, creates gaps in space. A sense of progressive movement is inscribed in the space producing "a series of intervals that one may traverse one after the other." (Foucault, 2020: 145-146) In organising ranks, it constantly provides positions for individual bodies. This conception can be useful in describing and explaining arbitrary yet powerful arrangements in the urban space, produced by interventions such as the urban screens – for spacing out and closing the gaps – allocating individuals in different slots or 'compartments' in space.

Fourthly, Foucault emphasises the lightness of instruments that make up the disciplinary space. Foucault notes that Bentham was surprised that panopticon institutions could be 'so light': there were no more bars, no more chains, and no more heavy locks. All that was needed was the assurance that the "separations should be clear and the openings well arranged." (Foucault, 2020: 202) Emphasis on spatial design makes exercise of power "lighter, more rapid, more effective." (Foucault, 2020: 209)

> The success of disciplinary power derives no doubt from the use of simple instruments. (Foucault, 2020: 170)

Being "both immense and minute" (Foucault, 2020: 223) makes it applicable and expandable across different realms of social life. It indicates how a single EER installed at an urban venue can be a simple operation, but a collection of them across the country can produce great effects, to become "a great and new instrument of government." (Foucault, 2020: 206)

Space of Control

This thesis also consults Deleuze's reinterpretations of Foucault's *disciplinary space*. Noting the historicity of power, Deleuze (1992) points out that operations of power get refashioned in each era along with the broader changes in the technological and organisational basis of a society. Foucault's theorisation is based on the affordances of technology that is historically specific to the era of mass production and industrialisation, according to Deleuze, which began "in the eighteenth and nineteenth century [to] reach their height at the outset of the twentieth."[41] (Deleuze, 1992: 3) If the nineteenth century was built on industrial technologies of enclosure, the twentieth and twenty-first centuries are built on structures of control mediated through the computer. *Space of control* is introduced therefore to expand on the different shapes of power that appeared in historical succession: *sovereign* (pre-industrial society); *discipline* (industrial society); and *control* (information and communications society).

C*ontrol* is an evolved variant of discipline, according to Deleuze. It is primarily modulatory; while disciplinary societies are based on *molds*, societies of control are based on *modulation*. The language of modulation is largely *numerical* as for example, in the forms of "code" or "password" that allow or reject access (Deleuze, 1992: 5)[42]. Deleuze declares that we have moved from surveillance characterised by the top-down 'gaze', towards control which "continuously change[s] from one moment to the other" (Deleuze, 1992: 4) through precise manipulations of computer technologies. It is a more mobile, and more flexible form of discipline. It requires a "dispersed installation". (Deleuze, 1992: 7)[43]

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41 Deleuze observes that Foucault theorised the disciplinary mechanisms at the time of their surpassing. (Deleuze, 1995)

42 An example Deleuze uses is Felix Guattari's discussion of one's (dividual) electronic card; what counts now is not the barriers, but the computers that track and modulate each person's position.

43 Williams (2015) adds that while control system is relatively decentralised, the apparatus may still be organised by centralised authorities, such as governments or corporate management. This structure of power as a "combination of

> [W]e move from closed centralised institutional sites with determinate rules to an open-ended system of relatively decentralised 'smart' control, where all systems are relatively interoperable and put into communication with one another. (Williams, 2015: 212)

Dispersion and decentralisation capacitated by information technology and communication networks have significant spatial implications. Deleuze notes how our spatial engagements are no longer so much about vast spaces of 'enclosure' as it was in the case of the hospitals, schools and prisons that emerged in the nineteenth century. Contrary these disciplinary spaces, the modulatory mechanism "gives position of any element within an open environment at any given instant." (Deleuze, 1992: 7)

The results of modulation are "coded figures – deformable and transformable" (Deleuze, 1992: 6) Body is still the critical place upon which power is exercised to reproduce itself as Foucault (2020) pointed out. Yet for exercise of power in contemporary societies, the body itself is not the focus of attention, as it was in the prisons, but the 'markers' on the body that modulate perpetually. It is not the "bodies that can be individualized" (Foucault, 2020: 208-209) that is at the centre of knowledge production in contemporary societies, but the 'dividual' of the bodies captured and reproduced through the information technologies. Although Deleuze wrote this essay in 1992, when the digitalisation of everyday was not fully fledged as it is today, this production of the 'dividual' as a form of knowledge about the bodies, is very much valid for explaining the technological mechanisms of the EER. Besides, this emphasis on the 'dividual' precisely explains the production the QR code by the very body (as microphysics of power is exerted on the surface between the body and the smartphone, according to Foucault).

It is noted before ending this chapter that while Deleuze's reinterpretations are useful in capturing the shapes of power in the era of digital technologies, Foucault's concepts, rather than Deleuzes's modifications are taken as the basis for creating the analytical framework for the field research (Figure 15). This is because firstly, Foucault's spatial conceptualisation is more comprehensive for establishing the relations between the bodies, knowledge production and production of space. Moreover, *control* as an evolved variant of *discipline*, is positioned within the broader Foucauldian understandings of power relationships. Secondly, as Foucault

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decentralised management with relatively centralised control settings" (Williams, 2015: 216) captures the decentralised dimensions of everyday technologies used for the EER; spread across the country to work as apparatuses to collect data; yet to be stored and processed through the operational protocols, established by the central government of South Korea.

(2020) points out, such different shapes of power (e.g. sovereign, discipline, control) are never exclusive in strict sequential or historical order in reality, but transiently co-exist at any time. Therefore, it should not be expected that *disciplinary space* has been entirely erased from our social life, but that power relations fabricated in the EER are composed of both displinary and control measures in complex and interrelated ways. Thirdly, Foucault's detailed discussions on spatial characteristics can act as a more helpful guideline for investigating specificities of spatial organisations during the field research, than Deleuze (1992)'s lightly sketched accounts that are more abstract and conceptual in nature. Deleuze's concept of control as discussed in this chapter, are instead to be used to explain findings from the field research that cannot be quite explained by Foucault's spatial concepts such as enclosure, partitioning, and serialization.

Chapter 3.

Methodology

3.1 Research Design

This research study is an *intrinsic case study* where the case itself (e.g., person, group, phenomenon, organisation etc.) is of primary interest in its exploration. Intrinsic case study aims to investigate a case in order to deeply understand the workings of a phenomenon. As a case study, it needs to be defined as a 'bounded system' (Creswell & Poth, 2018). Here, the case is defined as the 'real-time enactment of urban circulation as mobile bodies produce digital data at the sites of the EER' (Figure 7). It should be emphasised at the onset that the scope of this research is focused on the 'urban sites' where the data productions actually do take place. A human actor carrying the smartphone on the move logs into a mobile app in the smartphone and generates a QR code. He or she then approaches the designated smart screen located in the venue and scans the QR code. This performance allows him or her to move cross a boundary along with other codified mobile bodies, who together constitute a virus-controlled space.

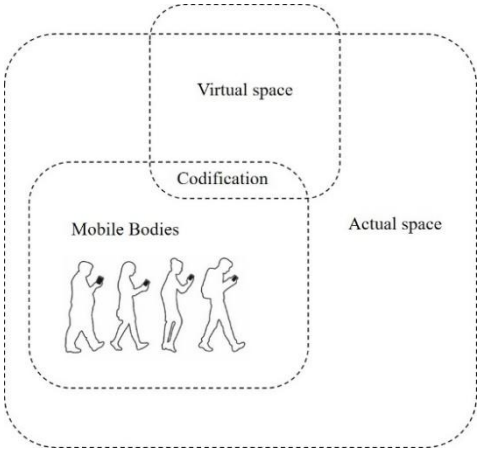

Figure 7. Bounded system of this case study; 'urban sites' where data production takes place

In order to translate this 'bounded system' into a workable research design with an assemblage thinking, this thesis is theoretically inspired by Braidotti (2017)'s concept of *cartographies of the present.* Resting on monistic ontology drawn from Foucault (1970) and Deleuze and Guattari (1994), this approach investigates assemblages of the present in the process of *becoming* by analysing different dimensions of power relations.[44] Braidotti asserts to expose both the restrictive structures (power as *potestas*, or entrapment) and the alternative representation of the subject (power as *potentia*, or empowerment). According to this instruction, the mobile bodies embody multiple power relations; they are not merely repressed by the authoritative powers and the structures of the EER imposed upon them, but also

44 The 'cartographies of the present' was devised with inspiration from the neo-materialist work of Foucault (The Order of Things, 1970) and Deleuze and Guattari (What is Philosophy?, 1994).

creatively find ways around and negotiate, with the prosthesis of the smartphones. The research questions of this thesis are accordingly translated into two embedded units of analyses (Figure 8). One is aimed to uncover the restrictive structures of the EER (power as *potestas*, or entrapment) and the other is to investigate the alternative representation (power as *potentia*, or empowerment). They are to complement each other to reveal the tensions and power relations in the construction of the EER.

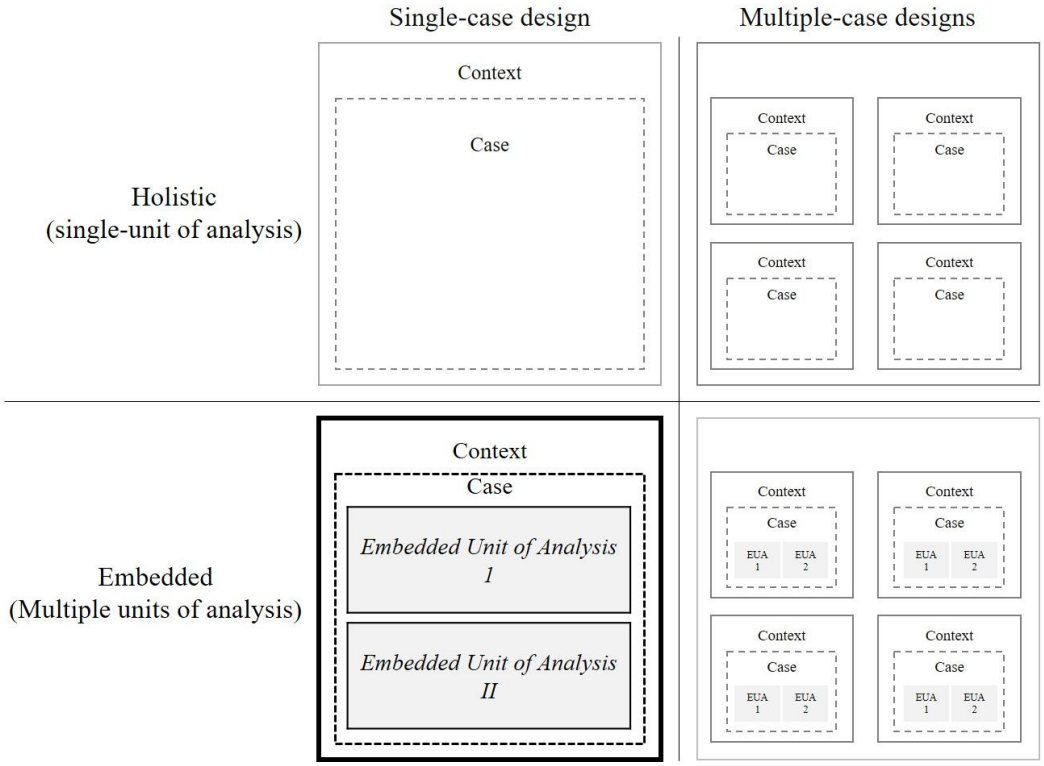

Figure 8. 'Single-case embedded design' of this research study

Figure 9 illustrates the main actors within the urban assemblage selected for initiating the empirical studies[45]. They are by no means the only actors that create significant effects in the

45 This methodological framework is advised by Brenner, Madden & Wachsmuth (2011) and others referenced in Chapter 2 (2.2) who advocate that "it is essential to explore who (or what, as the case may be) is doing the structuring to whom." (Brenner, Madden, & Wachsmuth, 2011: 236). As a dispositif that is formed to pursue a dominant strategic function engaging particular ways of mobilising the bodies of the citizens, the various actors in this study can be rather clearly aligned into who does the structuring (assembling) to whom (assembled). Indeed as noted in 2.2., this methodological proposition uses the assemblage thinking as an empirical and methodological orientation, rather than as an ontological approach. By pre-setting the interrelations among the actors and the actants, it limits research activities of 'following through' emerging relations and alternative exchanges that are out of the scope of the research design. This admittedly misses out on the opportunity of making an "inquiry [as] an open and explorative engagement with the urban." (Farías, 2011: 366) Nonetheless, the two methodologies are brought together for interpretations later on, to probe into the

construction of the EER of course, and indeed many interactions overlap in their exercise of power. Nonetheless, this thesis decides that the media and the citizens are the good starting points for initiating the interrogation of the relations between many actors and actants which are in effect, intricately interlinked. Justifications for each starting point is outlined in the following sections.

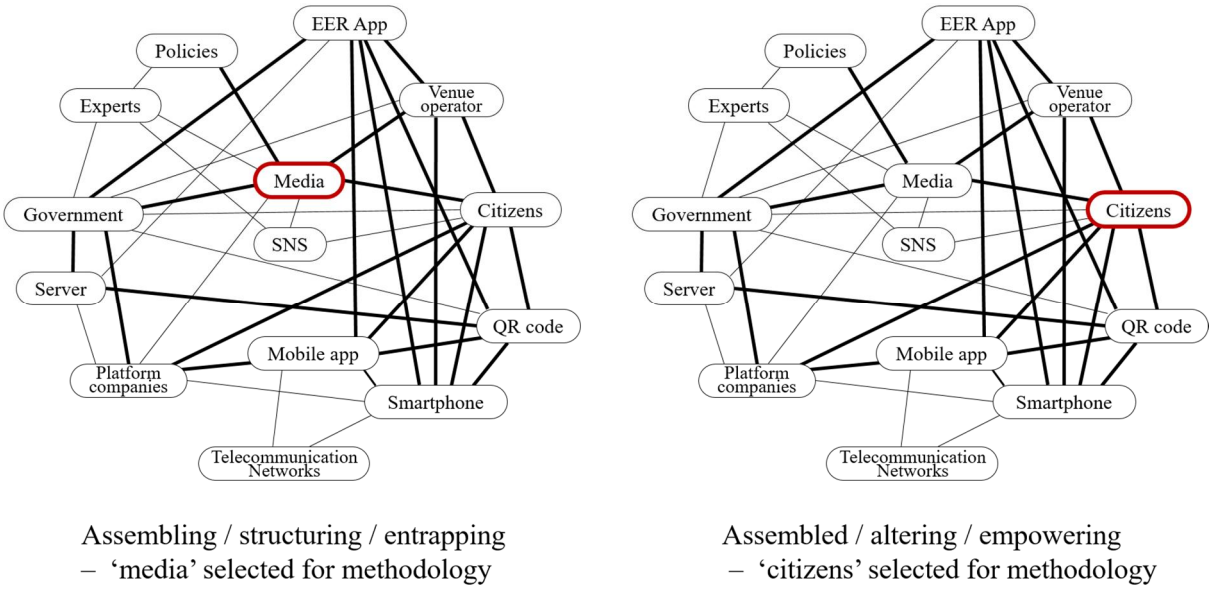

Figure 9. For initiating the empirical study, the major actors are selected based on "who is doing the structuring to whom" (Brenner, Madden, & Wachsmuth, 2011: 236)

3.2. Assembling / Structuring / Entrapping

This part of the empirical study examines the dominant formations of the EER. It aims to delineate how the EER was organised as the *mobile dispositif*. The media as one of the many actors in the assemblage (Figure 4) is chosen as the starting point for interrogating this process of assembling or "structuring" (Brenner, Madden, & Wachsmuth, 2011: 236). The reasons are as following.

News media in this study are understood as the discursive force in the formation of the EER. They have functioned as the crucial communication mechanisms through which the South Korean government enacted, defined, imposed and reshaped policies and practices in its

overlapping features on particular linkages and to re-question their multi-layered meanings (e.g. how the smartphone as the prosthesis is differently defined and perceived by the media and the citizen).

problem solving efforts. More than anything, the citizens in their everyday life, do not communicate with the government face-to-face. It is through the media that the decisions made by the government are delivered to the citizens. Indeed, the media played the critical agentic role in assembling the EER because it required foremost building of collective understanding, setting agenda and bringing in the various actors together into workable assemblages. With their nature of timely production, news media reports have become powerful tools for constructing reality, aptly responding to the fluctuating situations of the pandemic. Indeed, while the government's efforts in assembling the EER were mostly focused within the first few months (May-July 2021) before and straight after its introduction[46], the media sustained its engagements with the topic in a relatively steady manner throughout the phases until its maturation (Figure 4).

The news media delivered government announcements, captured conflicts between the government and the platform companies in their negotiations, explained detailed technical mechanisms of the EER (which were only briefly explained by the government itself), instructed the step-by-step procedures for generating the QR code, provided best practices, and criticised those who did not follow the rules. News articles are therefore considered better fit as the dataset for studying the agency of 'assembling, structuring and entrapping' than the government reports, as they provide much richer accounts on various 'linkages' among actors and actants in the assemblage.

The particular characteristics of the news articles used as texts in this study themselves provide further justifications on their use. What struck the researcher from the beginning of the analysis, was that there was not one incident in the dataset of 123 articles in which the South Korean news media took a critical standpoint on the system, regardless of their political stance (left or right). This finding is also backed up by the study carried out by Kim, Y., Chen & Liang (2021) who recognise that in South Korea, news media were major contributors that conducted such policing work. The authors identify the cultural discourse of South Korean media communications during covid-19 pandemic as "moralizing" (Kim, Y., Chen, & Liang, 2021: 9) in the normalisation of the system.

46 As described in the following chapters, other than creating the partnerships and making the official EER app, the government relayed most of the tasks in assembling and sustaining the EER to other parties such as the platform companies, the citizens and the venue operators.

Considering that South Korean news media normally are active to criticise decisions made by the government, this is a rather unusual phenomenon.[47] However, since this thesis is not a study on news media, it will not delve into the reasons behind this peculiar bias. Instead, this strong tendency of the South Korean news media supporting almost all decisions made by the government on the EER, and filling a significant part of their reports with direct quotations from the government briefings without much journalistic interpretation, was taken as the condition to infer that the texts produced by the news media have by and large, represented the government on the issue of the EER and the dominant structures produced by it.[48]

3.2.1. Content Analysis

For this study, the methodology of content analysis was employed to grasp how the spatial planning of the EER was projected, organised, and materialised. According to Krippendorff (2013), content analysis is "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use." (Krippendorff, 2013: 24) Content analysis is foremost "summarizing." (Neuendorf, 2017: 23) As a case study exploring a spatial planning that requires use of a particular digital technology by a population of an unprecedented extent, content analysis can increase the researcher's understandings of the structures and developments of the phenomenon.

This thesis follows the methodological grounds proposed by Krippendorf because it finds Krippendorf's definition of *content* particularly useful. Krippendorf defines *content* as to "emerge in the process of a researcher analyzing a text relative to a particular context."[49] He

47 Indeed, news reports on other political and social issues during the same period, such as relationships with North Korea or enactment of human rights laws concerning homosexuality, widely vary according to where they were positioned in the political spectrum.

48 Kim, Y., Chen & Liang (2021) in their recent study on South Korea and China's covid-19 tracking apps, discuss the "celebratory discourse within China and South Korea that supported the state's disciplinary actions, at least during the initial months of the pandemic." (Kim, Y., Chen, & Liang, 2021: 2) This thesis by no means takes for granted the results from quantitative and qualitative content analyses of the news media as 'facts'. This is also illustrated in the processes of carrying out the research: (1) the coding for quantitative and qualitative content analyses involved analysing data within the theoretical frameworks proposed in Chapter 2; (2) the methodology of critical visual analysis proposed by Rose (2001) was employed for analysing images used in the news articles, with emphasis that "[…] images are never transparent windows on to the world. They interpret the world; they display it in very particular ways." (Rose, 2001: 6); (3) the hypothetical groups of differently networked posthuman bodies uncovered in content analyses were further adjusted with the results from the field research.

49 Krippendorf sums up other two kinds of definitions of content analysis widely adopted by researchers. Contents are differently defined as: 'to be contained in a text' or 'to be a property of the source' of a text. He finds these two definitions limiting and instead suggests to define content as to emerge in the process of analysing a text relative to a context. For

points out that raw data can be read from numerous perspectives and the researcher's theories should play a role in how content analysis proceeds. Indeed, content analysis with its 'summarising' power has the risk of leading to results that are too 'vague' unless raw data are analysed around a concept or theoretical assumptions. Because this thesis has a conceptual grounds such as posthumanism, discipline and digital infrastructures at the centre of its research pursuit, it is important to be theoretically conscious throughout the course of the analysis.

A mixed method of combining a quantitative and a qualitative content analysis is employed in order to heighten the potentials of the raw data and enhance the reliability of the results. Quantitative content analysis precedes the qualitative content analysis for generating the first codes which will be investigated further using the qualitative analysis[50]. First codes are generated as the initial themes, based on the words most closely associated with the terminology 'electronic entry registers'. This first codes are further coded through qualitative content analysis. Both quantitative and qualitative analyses are assisted with the use of the computer softwares, AntConc 3.5.9 and NVivo 12 respectively[51].

The quantitative analysis is carried out with the use of the software AntConc, a widely used computer program for a corpus linguistics research. Exemplary studies adopting similar approach include for example, the research study of Joss et al. (2019) who used AntConc in order to understand how the concept of smart city is textually constructed across 27 cities globally, before carrying out qualitative analysis. Likewise in this thesis, AntCoc is run to

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details of his discussions, see Krippendorff (2013: 24-31)

50 This thesis does not use the terminology of 'open coding' and 'axial coding' but instead categorise the coding activities into two phases of 'first coding' and 'second coding'. During the actual practice of coding, the so-called 'open coding' (breaking data apart and delineating concepts that stand for blocks of data) and the 'axial coding' (activity of relating concepts to each other) "go hand in hand" (Corbin & Strauss, 2008: 198). In the 3rd edition of 'Basics of Qualitative Research', Corbin & Strauss (2008) suggest to abandon the distinguishing of the two coding activities (which they still had used in their 2nd edition of the book) as they see the distinctions "artificial" and serves only explanatory purposes. The authors also note throughout the book and this researcher agree, that the actual activity of crosscutting or relating concepts occur during making of the 'memos' in the course of coding. As analysis proceeds, memos become the place for spelling out the links between the two or more concepts.

51 Krippendorff (2013: 208) encourages making use of the information technology for content analysis as it alleviates the problems of unreliable coding and can process large volumes of data at high speed. However, the author recognises that computer applications have limitations too, mostly coming from the fact that computers do not read 'meanings'. He suggests that the use of computers is most appropriate for recurrent and repetitive tasks that are transparent such as counting, searching, sorting, and listing. In this thesis therefore, the use of the quantitative software AntConc is limited to counting of the words. Use of computer program is also beneficial as it can play an important role in evaluation. Because the records of decisions made throughout the course of analysis is easily trackable and can be reconstructed, computers increase what Clive Seale calls "methodological awareness" (Seale, 2002: 108) by creating the "audit trail" as Corbin & Strauss (2008: 310) also acknowledge.

discover a set of words most closely associated with the terminology 'electronic entry register'. This software facilitates a statistical association approach called 'co-occurrence analysis', which identifies and counts the words that are closely related to the search term. Frequencies of the words that are located up to the fifth word to the right and up to the fifth word to the left of the terminology 'electronic entry register' in the texts are counted. In other words, it is not the frequencies of *all* the words in the news articles, but the words most closely associated with the EER, that this quantitative analysis focuses on. This way, the words generated as results distinctively represent the EER rather than the general 'news' around the pandemic.

The concept of 'co-occurrence' is based on the assumption that "important words in a text are identifiable by their relative frequency" (Krippendorff, 2013: 245). Yet it is important to bear in mind that "the most important words and images may not be those that occur most often" (Rose, 2001: 150). In other words, a high frequency of certain words do not necessarily mean that they are most important. However, it can assist the researcher to grasp the overall patterns before going into a more in-depth analysis. Moreover, the particular characteristics of this dataset of news articles in constantly repeating the same words during the course of the pandemic, highlight the power of repeated mass communication in producing social realities such as the EER. Hence it can be argued that counting the relative frequencies of the words as they appear in the texts of the news articles, can prove to be a valid method in probing the mechanisms behind assembling the EER.

Next, the qualitative content analysis follows. The first codes identified in the preceding quantitative content analysis are further investigated in the qualitative content analysis for second coding. The texts (both written and visual) are analysed line by line, against the results of the first coding to add, modify and discard them. Both textual and visual analyses are facilitated in the NVivo software.[52] The following sections explain the methodological

52 NVivo is one of the most widely used CAQDA (Computer Assisted Qualitative Data Analysis Software). It is a useful tool for managing datasets of various sizes, mixed media and mixed methods data. Jackson & Bazeley (2019) note the capacity of NVivo for "recording, sorting, matching and linking can be harnessed by researchers to assist in answering their research questions from the data, without losing access to the source data or context […]" (Jackson & Bazeley, 2019: 2) However, the limitation of NVivo is that it is more supplementary than fundamental as a tool. It is a tool that basically provides a workspace that keeps the dataset in order and allows making notes in organized ways. But "it doesn't do the thinking for you" (QRS International, https://pt.slideshare.net/QSR_NVivo) and it does very little analysis for you (it does not do the coding for you). Also since it relies heavily on the input of the researcher, examining data through NVivo can limit the analytic frame – which is tackled by carrying out the quantitative analysis prior to the qualitative analysis to guide the researcher with the first coding and initial framing.

procedures for this analysis in order of data collection and sampling, quantitative content analysis, and qualitative content analysis.

3.2.2. Data Collection and Sampling

Population in this research is defined as the 'media communications on the EER during the covid-19 pandemic in South Korea'. This is a superpopulation, a hypothetical population of possible realisations. With almost all of today's news agencies having strong online presence, this study chooses online media for data collection. According to BigKinds (www.bigkinds.or.kr), the non-profit online news archive and data service run by the Korea Press Foundation, a population of 3,672 news articles were published online by newspapers and broadcasting companies, during the period of 24 May 2020 – 22 January 2021 (the date of writing this sentence)[53].

From this population, a sample size of 123 articles are selected with the following conditions. Firstly, news articles published in the period of 24 May 2020 – 31 December 2020

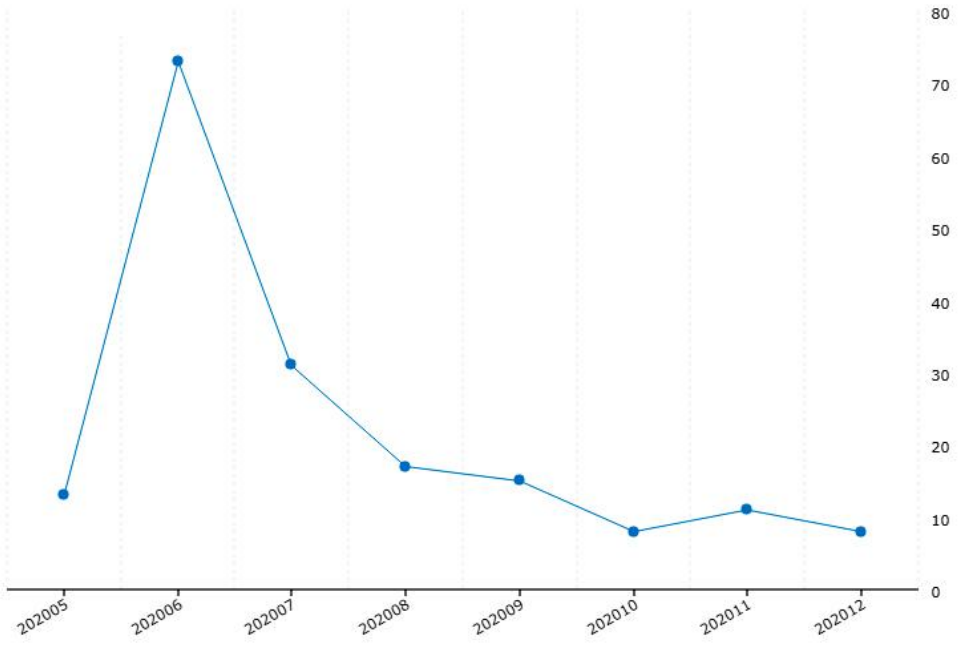

Figure 10. Frequency of terminology 'electronic entry register' as it appears in South Korea news media (diagram as generated in the website BigKinds)

53 Newspaper agencies and broadcasting companies officially recognised by the Korea Press Foundation are included in this study. Number of news articles is counted using the search engine in the BigKinds website run by the Foundation.

are collected.[54] The time frame does not include the year 2021 since as illustrated in Figure 10, the frequency of the terminology 'electronic entry register' as it appears in the headlines of the news articles starts to decrease dramatically in July 2020 and remains quite low until the end of the year (possibly indicating that the system had somewhat become 'naturalised' or mundane during the second half of the year and was no longer so much of a 'news' material)[55]. Secondly, only news articles with the terminology 'electronic entry registers' included in their headlines are included in the sample. Many articles with the terminology in their main body of contents (but not in their headlines) tend to deal with the term in a passing manner without accounting for it in significant ways. On the other hand, news articles with the terminology in their headlines do take the system as the major source of discussion, making them richer source for analyses. Finally, articles published by local newspapers are excluded because the geographical scope of this study is the capital city of Seoul.

The online news archive BigKinds was used for identifying the population and filtering out the sample of 123 news articles by the stratified method. The stratification was carried out as following. First, the words 'electronic entry register' were typed in Korean language in the search bar. The search was confined to the period of 24 May 2020 – 31 December 2020. Out of 54 news media companies recognised by the BigKinds service, local newspapers were excluded to result in 21 daily newspapers and 4 broadcasting agencies.[56] Next, only news articles with the terminology 'electronic entry registers' in their headlines were included and duplications were omitted. With this stratified sampling method, 123 news articles were retrieved as the final dataset.

54 The terminology 'electronic entry register' in the headline of a news article first appeared on 24 May 2020.

55 Furthermore, only 3 articles with the terminology 'electronic entry registers' in their headlines were identified to have been published from 1 Jan 2021 to 22 Jan 2021 (date this sentence is written).

56 21 daily newspapers with national distribution are included in the dataset: Ajukyungje, Asiakyungje, Chosun Ilbo, Digital Times, Donga Ilbo, Financial News, Hankook Ilbo, Hankookkyungje, Hankyoreh Shinmun, Heraldkyungje, Jeonja Shinmun, Joongang Ilbo, Kyunghyang Shinmun, Kukmin Ilbo, Maeilkyungje, Money Today, Munhwa Ilbo, Naeil Shinmun, Seoul Shinmun, Seoulkyungje and Segye Ilbo in alphabetical order. The four broadcasting agencies included are KBS, MBC, SBS and YTN. The city of Seoul does not have a commercially distributed local newspaper. The newspaper called 'Seoul Shinmun' is nationally distributed.

3.2.3. Quantitative Content Analysis

Procedure

This quantitative content analysis is a corpus-driven investigation. Using AntConc 3.5.9 software, the co-occurrence analysis is carried out to retrieve the 100 words that are most closely associated with the term 'electronic entry register' from the 22,257 words in the dataset of 123 news articles. This is facilitated by the tool called 'collocates' in the software. The procedure of the analysis is as follows: the words 'electronic entry register*' (with the wildcard of asterisk for including all the words that contain the three words), is entered in the search bar of 'collocates' menu. Five words to the left and five words to the right of the term 'electronic entry registers' are identified and counted. The default statistics in AntConc is MI (Mutual Information); it is the ratio of the observed frequency of two words co-occurring divided by the expected frequency of such combination (i.e. the frequency of co-occurrence by chance).

Of the total number of 1,555 words which were identified as associated with the term EER, the 100 most associated collocates were selected for first coding. (The total frequency of these 100 words appearing in the news articles is 1,603). Following is a set of standards employed for making decisions during the course of running the software and first coding on the retrieved collocates (Figure 11).

- For first coding, words were chosen so that they did not exude particular social, political, or cultural bias. For instance, 'government' was chosen over 'administrative order'. This was because the main objective of this quantitative content analysis was to broadly outline the texts.
- When similar collocates were repeated, they were not deleted or merged, but were left as they appeared in the software so that the true weight of the similar words were appropriately reflected.
- Words used for supportive purposes such as the auxiliary verbs, the 'be' verbs, prepositions, and relatives were omitted. e.g. can (수), are (있다), for (를), etc. (등)
- Words that indicated the departments within the news agency were omitted. e.g. IT (IT), Society (사회)
- When necessary, the contexts of sentence within which the word was used were examined in order to determine the meaning of the word. For example, words such 'based'

(기반) and ‘utilize’ (활용한) were almost always used before and after the word ‘QR code’. In this case they were first coded as ‘digital technology’.

- In cases where a single Korean word could only be properly translated into an English phrase (composed of more than two words), the researcher chose to do so, to prioritize the accuracy of meaning.

Analyses using the software were carried out in Korean language in order not to lose the original meanings too early in the stage. When quotations from the texts were used for discussing the findings, the Korean texts were translated into English by the researcher. This procedure of translation was applied to the use of both AntConc and NVivo software.

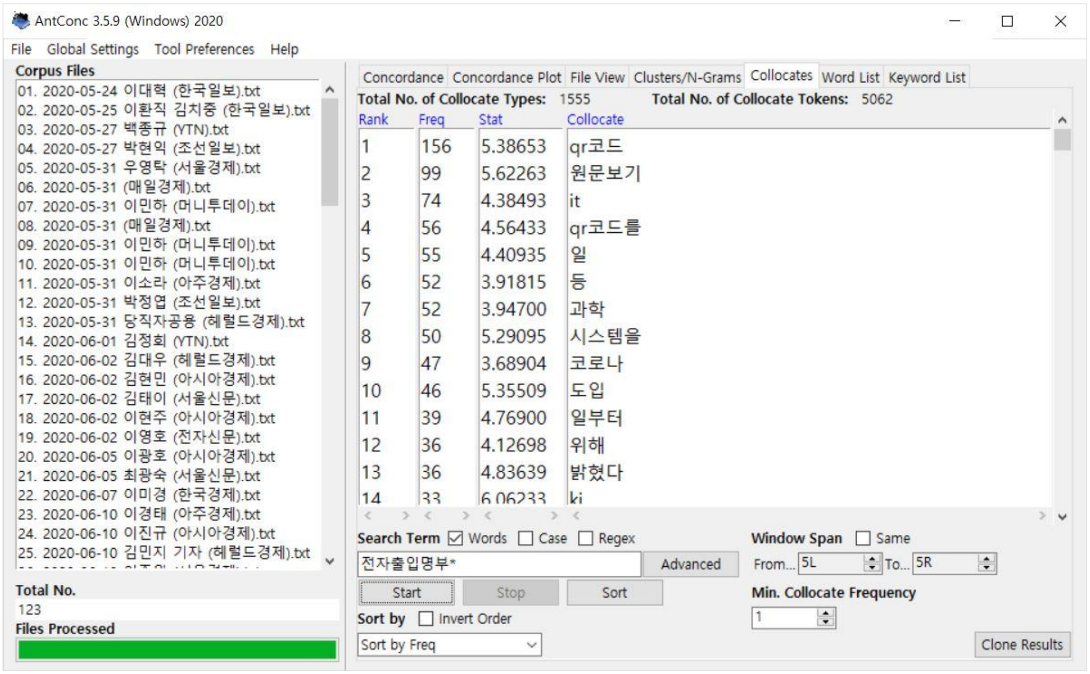

Figure 11. A screenshot of the result as shown on the screen run by AntConc 3.5.9 software

Results

Each of the 100 collocate (total number of 1,603 appearances in the texts) was coded to result in 10 first codes. Coding was guided by theoretical propositions discussed in Chapter 2, results of which are: (1) digital technology; (2) governance; (3) development; (4) problem; (5) time; (6) place; (7) platform; (8) participation; (9) spatiality; (10) accessibility. Table 1 shows a set of examples of collocates attributed to each code.

As mentioned earlier, it is acknowledged that the mere frequencies of words co-occurring with the search words ('electronic entry register*') do not necessarily indicate the ultimate strength of their socio-structural association. This is because various factors such as the contexts within which the words are used, the construction of the sentences, the positivity and the negativity of the sentences, affect the actual meanings. However, it is suggested that the 10 first codes identified by quantitative content analysis of 22,257 words from the 123 news articles, is a good enough starting point for implementing the qualitative content analysis that follows. These 10 first codes were not assumed as definite, but were open for further modifications with the second coding.

Table 1. The 10 thematic dimensions identified by co-occurrence analysis

First Codes	Examples of Collates (closely associated words to EER)	Frequency of collocates
Digital Technology	QR codes[QR코드], KI-Pass[Korea Internet Pass], Online banner[배너], app[앱], mobile[모바일]	407
Government	impose[도입], mandatory[의무화], inspection[점검], social security information service[사회보장정보원], plan[계획], community centre[동주민센터]	307
Development	system[시스템], test run[시범사업], arranged[예정이다], 개인정보[personal information]	162
Problem	corona[코로나], spread[확산], countermeasure[방안], 고위험[high-risk]	160
Time	to (certain) date [일까지], breaking news [속보], as for now [현재], coming [앞두고], swiftly[신속하게]	159
Place	club[클럽], Itaewon[이태원], cram school [학원], karaoke[노래방], date bars[헌팅포차]	149
Platform	Naver[네이버], 카카오[Kakao], 제로페이[Zero Pay], 카카오톡[Kakao Talk], 서비스[service]	94
Participation	collaborate [협조], complete[작성], use[이용], user[이용자], to participate [참여하는]	59
Spatiality	nationwide[전국], Seoul[서울], within the areas[일대], metropolitan areas[수도권], block[막기]	58
Accessibility	패스[pass], 출입[entry and exit]	48

3.2.4. Qualitative Content Analysis

The qualitative content analysis of 123 news articles started with the 10 first codes identified from the quantitative content analysis. As shown later, after the second coding of all the written and visual texts in the dataset all the 10 first codes remained valid, to result in 10 parent codes each with 2 to 5 child codes. Total number of 35 child codes have been identified.[57]

News articles as published in the official websites of the news media agencies were analysed in order of the dates published. By doing this, it was possible to grasp how the construction of the EER evolved throughout the course of the pandemic from its outbreak. Different actors (e.g. users, venue operators, local governments, commercial platform providers) were called upon in the news articles during different phases within this period. Focuses on urban spatialities also shifted, producing different kinds of images. Whereas the quantitative content analysis used only written texts as data, the qualitative content analysis included the visual texts. In fact, visual analysis of the images were critical in revealing the full potential of the dataset in its entirety because 92 out of the 123 news articles (74.8%) had some form of visual images whether it be a photography, diagram or video[58]. The coding procedures for qualitative content analysis is outlined in the following section. The remainder of this section focuses on the methodological principles and protocols used for the visual content analysis.

For visual analysis of images used in the news articles, this thesis followed the guidelines and frameworks proposed by Rose (2001). The author points out that "[…] images are never transparent windows on to the world. They interpret the world; they display it in very particular ways." (Rose, 2001: 6) Indeed, the regime of the EER was constructed in ways in which, for example, the images included and excluded certain components; emphasised certain bodies; showed enlarged images of particular texts; and deliberately produced blurred graphics. Of the three sites (site of production, site of the image, site of audiencing) and the three modalities (technological, compositional, social) proposed by Rose (2001) for implementing visual analysis, this study focused on the *site of image* itself and the *social modality*. The images published in the 92 news articles were laid out for analysis always with the texts (in the forms

57 The NVivo software uses the term 'nodes' to denote the results of the coding. This thesis will use the term 'codes' instead to refer to the results of coding in order to avoid confusion.

58 Videos embedded in the online news articles were the news clips broadcasted on TV. Videos were treated as a combination of visual and written texts where intertextuality played an important part. For analysing videos, particular attention was paid to the sequence of the images.

of captions, main body texts and sometimes the headlines) that explained how they should be read[59].

Intertextuality is "a method used to find the real meaning of an image in reference to other images or texts." (Jung, 2014: 991) Intertextuality in this study in particular, had two dimensions. First, it was the reading of an image in reference to the texts in the article. As just mentioned, most of the texts accompanying the images in the forms of captions, main body texts or the headlines point at how the images should be read. Particular attention was paid to how the meanings were interlinked and negotiated between the images and the texts. Second, it was the intertextual reading of certain images that continuously reappeared in the news articles during certain phrase (usually around one to two weeks). While news media generally (should) deal with 'new' contents, the dataset of 123 news articles in this study tended to consistently repeat the use of the same texts and images. The visual effects of such images thus should be interpreted not only on its own, but also by closely examining them in the context of this repetition.

Since the objective of this analysis is to investigate the social construction of the *mobile dispositif*, the *social modality* becomes the most significant aspect in the understanding of the images. It focuses on "the range of economic, social and political relations, institutions and practices that surround an image and through which it is seen and used." (Rose, 2001: 17) In summary, focusing on the cross point of the *site of image* and the *social modality* of the visual texts means that their effects and the assumptions behind them are examined in order to interpret the social and political relations embedded in the *mobile dispositif*.

Procedure

The 123 news articles as retrieved from the official websites are transformed into 123 files in PDF format (for textual analysis), 97 files in JPG format (for visual analysis)[60], and 8 files in MP4 format (for videos) to be uploaded on the NVivo software. (Figure 12, 13) The video data were further broken down into a sequence of image files in JPG formats and the spoken words

59 Most of the images were accompanied by 'captions'. However, for some images that had been repetitively used in the media, there were no captions; it is assumed that the reporters had started to take for granted that the readers should already know what the images meant without textual information, which, in itself showed that the EER had become mundane to certain extent.

60 Some of the 92 articles with images had more than one image in an article.

were transcribed in PDF formats. Video data were primarily treated as visual images that needed be interpreted intertextually with the available texts.

Figure 12. A screenshot of workspace on Nvivo 12 where coding of a news article is taking place

Figure 13. Along with the in-text analyses, 97 separate JPG files were created for close-up visual analyses. Captions were brought in juxtaposition with the image for intertextual analysis (top right corner in the 'content' box). Any area within the image can be selected (the dashed rectangle) to be coded (in this screenshot, the region of 50,670-2470,3100 has been selected for coding)

A draft of coding hierarchy was set up with the 10 first codes identified from the quantitative analysis. Through second coding, child codes were created as sub-themes that explained the parent codes. Visual images as they appeared in the main body of articles were closely investigated using the image files saved in JPG formats. Where there were captions, they were brought into the screen to be juxtaposed to the images for intertextual interpretations. Observations and insights that emerged in the course of the coding were noted using the

functions of memos and annotations. As noted earlier in footnote 50 with quotes from Corbin & Strauss (2008), the memo taking became the most important activity that interweaved the codes, which came together to form the core conceptual findings.

Results

The thematic structures of the parent and child codes have been revised three times before reaching finalisation. Attention was paid so that each parent code with a group of child codes had a clear theoretical implication. Child codes were attributed to a parent code in ways to avoid duplication. Below are explanations on each of the 10 parent codes informed by their child codes.

- *Digital Technology* – Efficacy of digital technology is often compared to human capacity (e.g. speed, accuracy) for justifying the introduction of the EER. Step-by-step instructions on how to manipulate the screens to generate the QR codes are constantly provided.
- *Government* – In a large proportion of news articles, the subjectivity is the government (hence the highest number of references). Government is mostly portrayed as the (only) problem solver. Accurate and real-time knowledge production is explained as the core strategy for tackling problems and making decisions.
- *Development* – Process of developing the EER reveals that this technological configuration is largely a social construction. Development requires repetitive accounts of instructions and explanations to bring together different actors. The system evolves throughout the course of pandemic in its scope, scale and mechanisms of applications.
- *Problem* – The EER is introduced foremost as a problem solving strategy. It is explained that most problems in the fight against the pandemic come from human downside (e.g. deceitful behaviour, inaccuracy). Problems emerging in knowledge production (e.g. invisibility, privacy) are also mentioned consistently to justify use of digital technology.
- *Time* – Sense of urgency and emergency becomes the most important factor in advocating the needs to bring everyone together. Often particular dates are explicitly indicated. Critical moments in time such as the previous herd infections, or forthcoming social events are repetitively referred to as part of the warnings.

- *Place* – Particular places such as the 'high-risk' facilities are frequently exemplified with visual images depicting them as risky and invisible. The term 'epicentre' is often used to remind the readers of the previous herd infections, which were mostly formed through particular social relationships such as the gatherings of young clubbers.
- *Platform* – The government requests commercial platform providers to lend the mobile apps and embed the QR code function in them. This process secures ready-made online population for the EER. It reveals the clashing interests between the government and the commercial sector in their collaborations in building the digital system.
- *Participation* – From the early stage, it is emphasised that the success of the EER lies in the performances of the individuals. Venue operators' responsibilities and the visitors' good conducts are repetitively referred to, exemplified, and criticized.
- *Spatiality* – The lightweight-ness in the installation of the EER allows flexible modes of manufacturing different scopes of urban space. Placed wherever needed in swift manner, the EER follows the traces of the virus-carrying bodies. These spaces are produced in erratic manner along with the movement of these virus-carrying bodies.
- *Accessibility* – Access across the urban space is gained through the various means of digital technologies. Along with the EER, other 'smart' systems such as the 'smart pass' for sensing different parts of the mobile bodies (e.g. checking if the individual is wearing a face mask) are used to complement the EER.

The codes 'government' and 'participation' had highest number of references, with almost more than twice as many times identified than other codes. While it was previously noted that a high frequency of words do not necessarily mean that they are most important, the high degree of repetition of the words indicate that overall, the construction of the *mobile dispositif* relied on the government as the subjectivity of this new system, summoning its population for participation. The final results of the coding from quantitative and qualitative content analyses are shown in Table 2.

Parent code	Child code		Number of reference
Digital Technology	(un)easiness	interface	146
		setting up	
	efficacy & efficiency		
	flexible expansion		
	the screens		
Government	agile governance	agreement and feedback	465
		shifting durations	
		shifting measures	
		test & trial	
	data & knowledge production	all knowing entity	
		no hole	
	EER as service & control	control	
		service	
	governing as problem solving	taking initiatives	
		updating, tackling, decision making	
Development	instructions & explanations	explanations	271
		instructions	
	social construction	actors-in-formation	
		announcing commencement	
		communication	
		crisis	
	system that evolves	becomes more bodily	
		changing procedures	
Problem	downside of human performance	deceitful behaviour	219
		inaccuracy	
		risk of bodily contact	
	invisible movements		
	privacy		
	timeliness		
Time	emergency & urgency	emergency	57
		urgency	
	critical milestones		
	'time of entry' as only new data		
Place	'high-risk' venues	herd infection	162
		invisibility	
	'epicentres'		
	place as group & relationships		
Platform	clashing interests	government - user traffic	234
		provider - promotion & expansion	
	platform providers as subjects	patriotism	
		providing service	
	citizen-consumer blur		
	solving problems as it goes on		
Participation	(non-) networked subjects	networked subjects	412
		non-networked subjects	

	emphasis on performance	best practice & good conduct	
		responsibility on users	
		responsibility on venue operators	
	collaboration & negotiation		
	shifting participatory modes		
Spatiality	density & mobility	dangerous mobile bodies	137
		internalization of urban space	
	small scales	blocking	
		exponential spread	
		local community	
		quarantine blank	
	easy expansion		
	existing nodes		
Accessibility	bodily gaze through sensor		34
	virtual & physical boundary		

Table 2. The result of coding for qualitative content analysis using software NVivo 12

The categorised codes were iteratively brought together and reorganised to be finalised into core findings. The findings have naturally emerged in the process of memo taking (Figure 14). Memos have been used for documenting analytic thought process such as exploring data, identifying concepts, developing categories, making comparisons, refining questions, establishing relationships, and developing a story line. Memos provided a storehouse of analytic ideas that could be sorted and re-sorted, to become the threads of ideas that ran across the 123 news articles. As a useful archive, it reminded the researcher of the specific decisions made in the course of the analysis and allowed her to easily cross-reference categories for further revision and refinement.

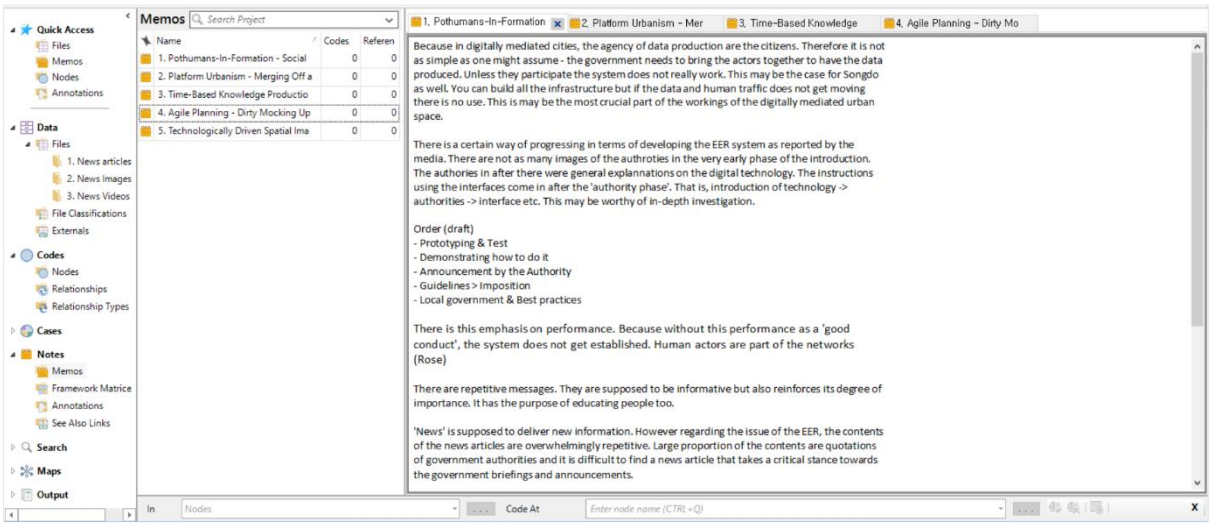

Figure 14. A screenshot of the memo function in the NVivo 12. The thematic findings developed as the analysis proceeded.

3.3. Assembled / Altering / Empowering

This study examines the sites where the EER operates across the city of Seoul during the pandemic. The 'citizens' in the urban assemblage (Figure 4, Figure 9) are the actors chosen for studying the agency of 'being assembled', 'altering' and 'empowering'. The researcher observes the research participants' *manoeuvre* – their performances and spatial engagements – as they pass through the EER. The data collected in the field are analysed using the methodology of grounded theory. Its methods of breaking down the *processes* of a phenomenon makes it useful for this investigation. This chapter first sets out its analytic. Methodological decisions for data collection and analysis follow.

3.3.1. Analytical Framework

The analytical framework for this study is devised as in Figure 15. Two areas of investigations are the interrelated concepts of the docile bodies and the disciplinary space. The *manoeuvre* as one goes through the EER are observed: the speed, directions, interactions, postures, and gestures performed with the smartphone. The organisations of space at the sites of the EER are observed in detail. Foucault's concepts such as the 'enclosure', 'partitioning', 'serialization' and 'gaze' guide this interrogation. Deleuze (1992)'s concept of *space of control*, as discussed in Chapter 2 ,is used as a tool to explain findings from the field research that cannot not be quite explained by Foucault's spatial concepts.

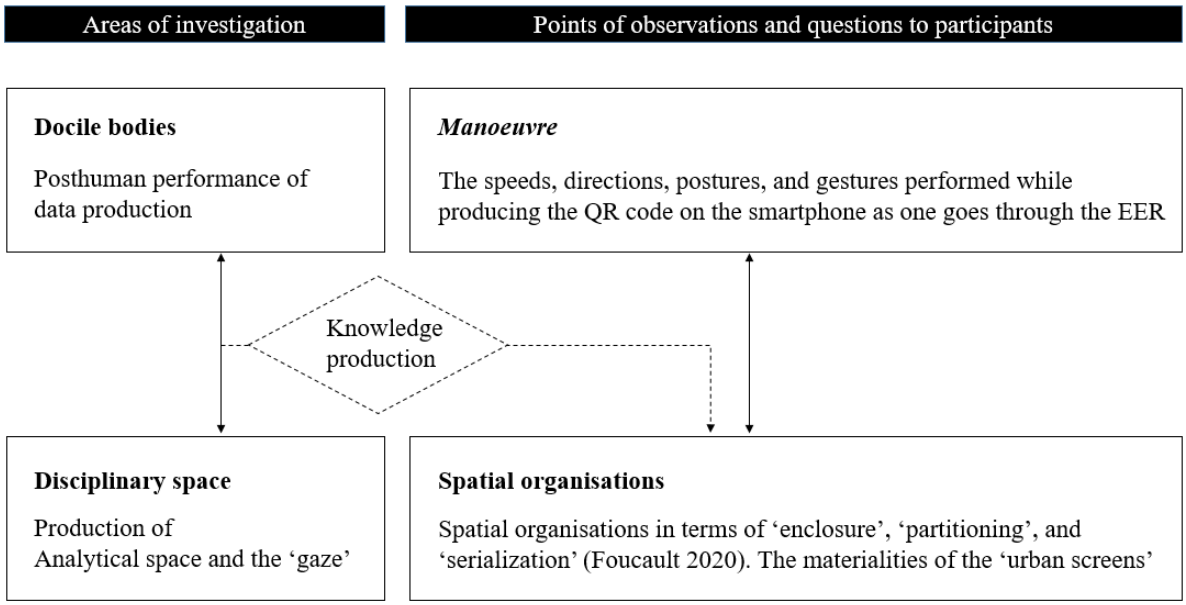

Figure 15. Analytical framework for field research at the sites of the EER

3.3.2. Grounded Theory

This study employed the methodology of grounded theory. There were two reasons for this. Firstly, it is useful for investigating the *processes* of a phenomenon. It provides some useful analytical strategies for this end, such as the *coding paradigm,* which guides the researcher to make systematic observations and to attend to details during the analysis. Secondly, the methodology assists "researches [that] aim for thick and rich description." (Corbin & Strauss, 2008: 16) Although grounded theory was originally developed in sociology for building substantive theories, it is also claimed to be useful for studies which aim for rich descriptions on processes individuals go through to overcome problems. (Corbin & Strauss, 2008)

The procedures proposed by Corbin & Strauss (2008) were used as they were more theoretically bound and methodologically systematic than those proposed by for example, Glaser (1992).[61] Important research methods for this approach included *theoretical sampling* and *coding paradigm*. For data collection, Corbin and Strauss propose *theoretical sampling*, a method of purposeful sampling[62] that emphasises "data gathering based on evolving concepts." (Corbin & Strauss, 2008: 116) It is a sequential and iterative approach to data collection and analysis based on the concepts derived from data. By alternating data collection with data

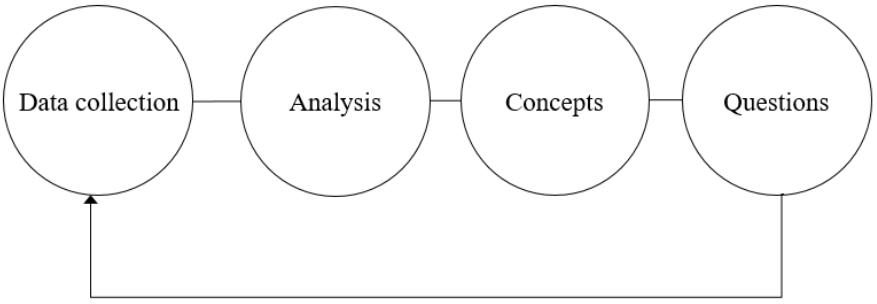

Figure 16. Process of *theoretical sampling* as explained by Corbin & Strauss (2008: 144). (Diagram drawn by the researcher according to the explanations)

61 Grounded theory was first developed in sociology in 1967 by Barney Glaser and Anselm Strauss. Despite the initial collaboration, the two researchers ultimately disagreed about the meanings and approaches of the methodology. For Glaser (1992), grounded theory must always build on iterative comparisons between data and concept and avoid preconceived interpretations from existing theories until core categories emerge through analysis. Strauss with his co-author Juliet Corbin (1990, 1998) on the other hand, took grounded theory to a different direction and stands for referring to existing literature continuously in order to increase theoretical sensitivity (which Glaser sees as 'forcing' the researcher's ideas on data). For this analysis, the procedures of Strauss and Corbin's grounded theory is used. This is because it is already theoretically informed.

62 In qualitative research, purposeful sampling is generally used. It is a method for selecting individuals and sites that can inform an understanding of the research problem and central phenomenon in the study. (Creswell & Poth, 2018: 158)

analysis, its purpose is to maximize opportunity to ensure "density" (Corbin & Strauss, 2008: 112-113). For this, analysis should begin after completing the first interview or observation so that the researcher can identify relevant concepts from early on, and follow further with emerging questions. For 'filling in', the researcher returns to the field to selectively gather additional data. Concepts are scrutinised further against newly collected data, compared, added to, modified, or invalidated (Figure 16).[63]

Coding paradigm, a method of analysis devised for implementing the grounded theory, assists delineating the process of experiences under study. Process is an "ongoing flow of action/interaction/emotions occurring in response to events [...]"[64] (Corbin & Strauss, 2008: 247) The 'process' that is investigated in this analysis is the 'process of performing the

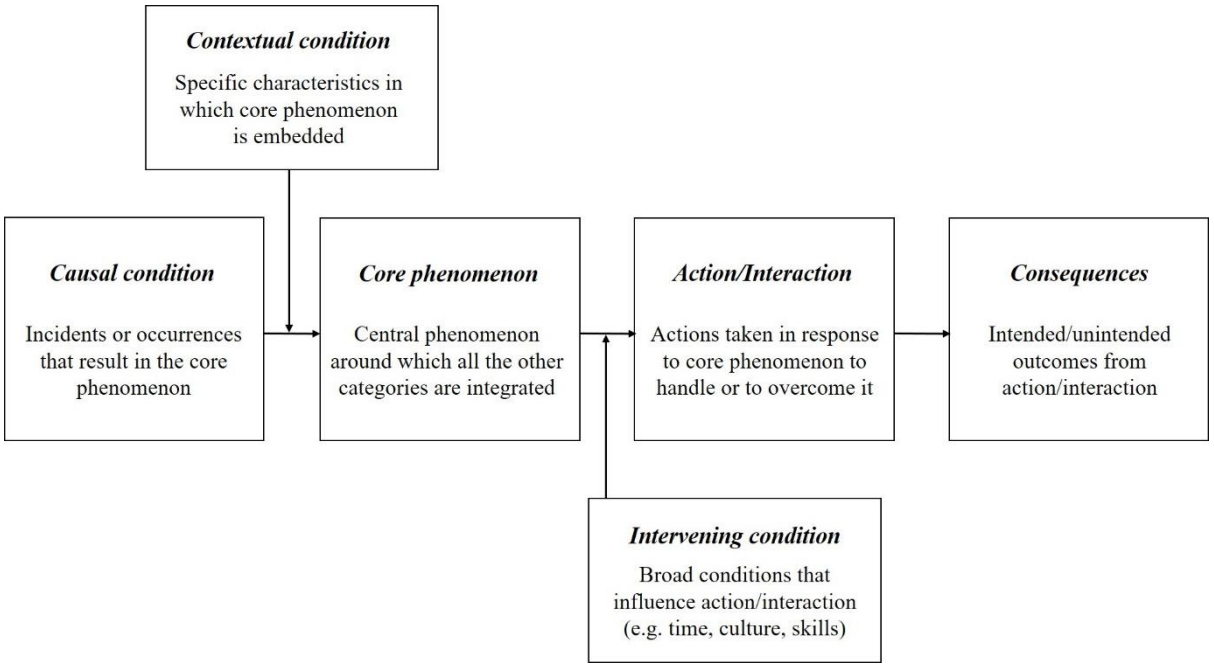

Figure 17. Schematic diagram illustrating an example of 'coding paradigm'. Revised and redrawn by the researcher.

63 This technique increases the researcher's theoretical sensitivities as the research progresses, and provides a sense of direction and ability to find spots that may need more attention along the way. For example, the researcher may find it necessary to reach out for participants who have a similar degree of mobility as the delivery persons but not perceived as 'network escaping', in order to fill in the gaps in understanding the EER 'gaze' that are not answered by the delivery persons themselves. As such, the cumulative nature of theoretical sampling is useful for fully exploring what 'network escaping' bodies are in digitally mediated cities, than conventional methods which establish sampling before the research begins (e.g. having a certain number of delivery persons already recruited before the interviews).

64 Emotions are understood to be indistinguishable from actions as they are often associated with further action or inaction and indicate the meaning of events to persons. "For us, there is no dualism. One can't separate emotion from action; they are part of the same flow of events, one leading into the other." (Corbin & Strauss, 2008: 7)

manoeuvre for the EER'. For analysing data for process, Corbin and Strauss suggest useful questions including: what are the problems or situations as defined by the participants? What are the structural conditions that gave rise to those situations? How are persons responding to these? What conditions/activities connect one sequence of events to another? (Corbin & Strauss, 2008: 100) Answers to these questions can be formulated to each of the categories the authors prescribe. They are *core phenomenon*, *causal conditions*, *contextual conditions, intervening conditions, actions/interactions*, and *consequences*. A *coding paradigm* is developed by examining how these categories interrelate (Figure 17)[65]. The meaning of each category is specified to provide points of inquiries while in the field (Table 3).

Table 3. Categories of coding paradigm specified for this study

Causal condition	Background conditions for the individual regarding the use of the EER. (e.g. everyday engagements with smartphone, personal histories regarding the EER, motivations behind using the EER, learning experiences before using the EER)
Contextual condition	Specific performances required on, and spatial conditions surrounding the individual, which may differ from place (venue) to place. (e.g. spatial arrangements, guidelines, length of the queue, location of the EER in the venue, number of screens etc.)
Core phenomenon	The *manoeuvre* – manipulating the smartphone to produce the QR code and having it scanned by the designated screen as one moves through the EER. (e.g. interactions enacted at the interface between the body and the smartphone, speeds, directions, postures and gestures, movements)
Intervening condition	Any condition that affects the posthuman performance of the individual that brings about the differences among them. (e.g. skills in using smartphone, smartphone model, app one chooses for QR codification, stand-by status of the smartphone such as switching on and logging in)
Action/interaction	Accounts of any moments the individual takes actions to handle difficulties in performing the *manoeuvre.* (e.g. logging in before joining the queue, stopping in the middle of the performance, giving up, asking for instructions, making strategies on how to overcome difficulties)
Consequences	Perceptions of the experience (e.g. spatial organisations, data, network, movement), meanings one finds in engaging with the system (e.g. effectiveness, the social, body, citizenship) and the level of embodiment (e.g. naturalization, smartphone as prosthesis)

65 The diagram has been drawn by the researcher informed by three different case studies that employ Corbin and Strauss's methodological procedures (Choi & Hong, 2017; Karimimoshaver et al., 2020; Webster, 2016). The definition of each category in the diagram is from Vollstedt & Rezat (2019) which focuses on the practices of developing coding paradigm.

3.3.3. Data collection and sampling

Sample size and recruitment

A sample size of 9-12 was aimed for. This study employed grounded theory not for theory building[66], but for micro-analysis that would result in rich descriptions of the phenomenon. For this reason, it was preferable to focus on detailed descriptions on each participant, to obtaining a larger number of participants. As Crouch & McKenzie (2006) argue, smaller sample size do have positive impact in research where in-depth analysis such as interviewing for subjective perceptions, feelings and reactions is the epistemological foundation. The knowledge produced with in-depth interviews and detailed observations also require better insight into the social conditions of participants' lives that are reflected in their experiences. However, it was difficult to grasp from literature review a suggested number of participants when grounded theory was used for rich descriptions rather than theory building; therefore the researcher consulted Creswell & Poth (2018)'s suggestion of 3-10 participants for phenomenological studies as the approachable scale for this study, and reasoned to have three or four rounds of the three hypothetical groups to aim for 9-12 participants. The range of sample size also took consideration of resource management: researcher's commitment of fully engaging with each participant for in-depth observations and analysis, and the ethical considerations to minimise the participants' total burden.

As explained previously this study used the method of *theoretical sampling* for data collection. As the starting point for recruitment, it used the three hypothetical groups of differently networked individuals (the *already networked*, the *yet to be networked*, and the *network escaping*) as they were identified in the content analysis. After each round of data collection and analysis, 'sample selection rationale', as advised by Corbin & Strauss (2008), was prepared based on the questions that emerged through the course of the analyses. The sample selection rationale provided detailed accounts of how conceptual 'density' was fulfilled throughout the course of recruitments (Table 7). *Theoretical sampling* as a method of data collection also helped the researcher explore emerging differences between the posthuman bodies.

66 Creswell & Poth (2018: 85) recommend 20-30 individuals as sample size for substantive theory building using grounded theory. For phenomenological research, the authors suggest a sample size of 3-10.

Methods for data collection

For recruiting, notices were posted on various online boards including those also often used by the elderly people.[67] As the field research took place in the midst of the covid-19 pandemic, the unfolding situations on the restrictions of group gatherings made it difficult for the researcher to make use of offline methods to invite the research participants. For collecting data, the field research involved three steps: (1) walking interview (2) observation (3) sit-down interview. The researcher met the participant during her or his daily activities. For example, if the participant was scheduled to visit a doctor, the researcher met and walked with him or her to the hospital. The meeting point was to be 10-15 minutes away from the destination, during which the walking interview took place. At the destination, the participant performed the QR codification and the researcher observed the performance. After the performance, a sit-down interview took place for elaborating on the experience. (Extracts from interview transcriptions and observation notes are provided in the Appendix.)

(1) Walking interview

The walking interview was a way of engaging with the participants 'on the move'. As Evans & Jones (2011) said "data generated through walking interviews are profoundly informed by the landscapes in which they take place" (Evans & Jones, 2011: 849), the walking interview was effective in grasping the participants' mobile experiences in the particular urban spatiality of Seoul, and in contextualising the experience of the EER within their everyday activities. It was also useful as an introductory talk that built rapport between the researcher and the participant.

As a warm up phase, opening questions such as how the participant used the smartphone and how he or she felt about it, and the participant's personal histories and learning experiences regarding the EER were asked. Also the relationship between the device and the person, or the level of prosthetic-ness was questioned because performing for the EER needed be understood within the context of his or her engagement with the device as already embedded in everyday life. The walking interview centred on uncovering the *causal conditions* as specified in Table 3. It was semi-structured as in Table 4. The interview was voice recorded for transcription.

67 Prior to starting the recruitment, ethical approval was obtained for all protocols from Seoul National University Institutional Review Board (IRB) to confirm that the study meets national and international guidelines for research on humans.

Table 4. Semi-structure questions for the walking interview

Confirmation of consent and basic information ・Confirmation of consent ・Briefing on how the study proceeds	
Everyday mobility ・Can you explain where we are going today? How often do you visit this place? ・Do you feel how you move around in Seoul is any different before and after the EER?	
Smartphone as prosthesis ・What is your smartphone brand and model? How is your network connectivity doing? ・What are your three most frequently used mobile apps in daily life? ・How close do you feel towards your smartphone? Can you give me any anecdote related to this? ・How many hours or minutes a day do you feel you are away from your smartphone? ・How essential is using a smartphone for leading everyday life in Seoul? Do you have any experience or daily scenes you can think of regarding this?	
Personal history and learning experience on the use of the EER ・Do you remember when it was the first time you used the EER? How difficult or easy was the first experience for you? ・Did you have to learn to use the EER? If so, how did you learn? ・Would you say that you are already familiar with the EER? ・What is a word you can just throw at me now when you picture the EER in your mind?	
Related category: (coding paradigm)	*Causal Condition*
Data collected:	Basic information, everyday mobility, smartphone as prosthesis, personal history and learning experience on the use of the EER
Recording / device:	Voice recording / portable voice recorder

(2) Observation

Upon arrival at the destination, the participant went through a series of performances with his or her smartphone to produce the QR code and have it scanned by the designated screen. Each step involved in this process was observed in detail. Although complicated as a process, the duration of performance mostly lasted less than one minute. Therefore, the researcher video recorded the participant's performance. Video recording captured 'in-the-moment' details as well as the non-verbal dimensions of the experience. When captured images that contain other people (e.g. people in the queue) needed be used in the body of the thesis for illustration, their faces and any other parts (e.g. texts on apparels) that could possibly be used for identification,

were blurred out. Along with the observation in the field, the documented video was examined multiple times for delineating the *contextual condition, core phenomenon, action/interaction* as specified in the Table 3. The observation was semi-structured as in Table 5.

Table 5. Inquiries for observing participants' performance for the EER

Field contexts and spatial dimensions of the EER ・How is the overall spatial organisation of the place? (entrance, exit, location of the screen, direction and shape of the queue, serial arrangement of the space) ・Is there anything particular about this venue (e.g. performance required, spatial arrangement) that is different from other places? ・How are the screens arranged and how many are there? ・Is there an assistant? Is he or she controlling the movement? How is he or she doing it? ・How long is the queue? How fast is the queue moving?	
Manoeuvre ・What is the order of the manoeuvre in terms of the participant's postures, gestures, and movements? ・Is any part of the participant's manoeuvre different from others in the queue? ・How is the participant manipulating the smartphone (e.g. speed of performance, steps taken)? ・Does the participant know what to do by heart? ・Is there any factor that affects the participant's performance, such as the collective flow of movement or the assistant's reactions?	
Problem and strategy ・Is there any moment of difficulty faced by the participant? If so, how does he or she solve it? ・Does the participant demonstrate emotions of success or failure? ・Does the participant show any kind of strategies or tactics for his or her performance?	
Related category: (coding paradigm)	*Contextual condition, Core phenomenon, Action/interaction*
Data collected:	Field contexts and spatial dimensions of the EER, Manoeuvre, Problem and strategy
Recording/device:	Video recording / portable video camera

(3) Sit-down interview

During the sit-down interview that took place after performing for the EER, the participant was asked to reflect on his or her experience. The sit-down interview took place for 30-40 minutes. With *theoretical sampling*, the exact questions asked depended on which concepts needed further elaboration from that particular participant. Semi-structured interview was designed to ensure relevant data were collected while letting the participant express what he or she found

important and relevant regarding the experience. Attention was paid mostly to the flow of the questions so that it had a room for the participants to express their opinions freely and talk with details.

As a study where differences between individuals were important aspects of its investigation, if a participant brought up a topic that was not included in the prepared questions but proved to be significant to the study, the researcher followed through on that topic. The sit-down interview centred on uncovering the *intervening condition* and *consequences* of the coding paradigm (Table 3). The sit-down interview was semi-structured as in Table 6.

Table 6. Semi-structure questions for the sit-in interview

Frictions ・Which mobile app did you use for QR codification? Do you often use the app in everyday life? ・Was the phone already logged into the app? Do you feel that the process went smoothly? ・Is there any part of the smartphone use that is different from your everyday engagement? ・Is there any part in the process you felt uncomfortable or uneasy? ・Is there any part of the process you want to talk more about?	
Outcomes, meanings, and implications ・What do you think the EER is all about? ・What do you find most interesting or concerning about the EER? ・How do you feel about sending personal data in the format of QR code? Where do you imagine or think it goes after the scan? ・Do you feel you are by now familiar with the EER, or have naturalized it in your daily life? ・If possible to imagine such a thing, where did you feel the spatial boundaries were when you were using the EER? ・If you can picture it in your mind, how do you imagine your being networked in that place? ・If there is any feeling, impression, or thoughts that come to your mind regarding today's experience, would you share it with me?	
Related category: (coding paradigm)	*Intervening condition, Consequences*
Data collected:	Frictions, outcomes, meanings, implications
Recording / device:	Video recording / portable video camera

3.3.4. Field Research

Procedure

Using the method of *theoretical sampling* for recruitment, the field research worked with 11 participants in total. Table 7 shows the 'sample selection rationale' created for each round as the researcher came up with new questions as the field work unfolded. After the fourth round conducted for the *network escaping*, it was decided that enough 'density' (Corbin & Strauss, 2008: 112-113) was attained and the field work was brought to an end. (AN=*Already Networked*; YN=*Yet to be Networked*; NE=*Network escaping*)

Table 7. Sample selection rationales prepared for the theoretical sampling

Sample selection rationale for second round		
AN	Physical Prosthetic-ness	Extent of digital technology expected to be embedded in the body (e.g. fingerprints for registering, use of wearable device such as the smart watch) for understanding the level of prosthetic-ness regarded useful for the mobile bodies in urban space.
	Presence of 'gaze'	Role and meaning of 'gazer' (in the name of assistant) in the construction of the EER as perceived by the *already networked* bodies, for delineating the differences between the disciplinary space and space of control in contemporary urban space.
	Perception of Digital Data	Perceived effectiveness and usefulness of the QR code, for understanding the level of agency the *already networked* individuals feel about themselves as producers of the digital data.
	Always 'On' (Logged In)	Importance and unimportance of being always 'on' for producing the QR code for the EER, for accounting for the level of networked-ness or online presence necessary for leading urban life in digitally mediated cities.
NE	Escaping 'gaze'	Any personal experience (actions, thoughts, feelings) regarding the 'gaze' and any attempts made to escape it, for conceptualizing the materiality and scope of 'gaze' in the urban space.
	Logging into a Space	Processes required for logging into a space, particularly in the case of reserving space or 'seats' using the smartphone, for understanding the leveraging effects of digital technology in spatial organisations.
	Spatiality of Distribution	Perceived mobilities of goods and people across the urban space, for discerning the imagination of urban circulations and its logics as reconstituted by digital technology and communications networks.
YN	Learning the EER	Accounts of learning experiences around the EER and the perceptions on the 'rest-assured phone call', for understanding the becomings of the posthuman agency capable of producing

		digital data in urban space.
	Perception of QR Code	Imagery, the workings, the productions, and the movements of the QR codes as perceived and imagined by *yet to be networked* individuals for understanding the becomings of the posthuman agency.
	Mobility & Speed	Any incident that imposed one with certain speed of manoeuvre and ways of *dressage*, for delineating the speediness embedded in the EER as a part of its constitutive process.
	Sociality of Networks	Understandings how one perceives the society's encounter with the EER and if there is any sense of warmth, care or connectedness associated with its use, for delineating if digital networks complement social interactions of the physical world.
Sample selection rationale for third round		
AN	Embodied Interface	Accounts of furthering embodied-ness of interface on smartphone by hacking or reconfiguring digital technology, for understanding the reasons behind making one's interface with the urban screens more direct and seamless.
NE	(In)efficacy of the Digital	Experiences of forging handwritten register (forging not only the address but also phone numbers) and comparing it with the experience of EER, for understanding the differences digital technology makes in the performance of producing data.
YN	Surviving the EER	Accounts of different strategies *yet to be networked* use in order to sustain their mobility in the city, for understanding the different ways of catching up with the EER that take for granted particular posthuman bodies and speeds.
Sample selection rationale for fourth round		
NE	Hyper-mobility	Perceptions on being criticized as a group of 'virus spreaders' (e.g. young adults) due to relatively high level of engagements in social activities and of mobilities.

As the field research progressed it became clear that some distinctions among the three hypothetical groups became blurry. For example, a lot of participants recruited as *already networked* or *yet to be networked* revealed themselves to be also partly the *network escaping* (e.g. changing the last digit of mobile phone numbers in the handwritten register) All of those recruited as the *network escaping* proved themselves as *already networked.* (Table 8) While specific questions for consequent 'sample selection rationale' usefully evolved according to the theoretical assumptions behind the hypothetical groups, questions were interchangeably asked when a participant proved to have mixed traits. The differential capacities to exercise agency (Rose, 2017) was the clearest difference that emerged among the participants. Later on

in the 'sample selection rationale', some questions aimed to clarify the intensity of such difference[68].

		Traits revealed after field research		
Participants	**Recruited as**	**AN**	**YN**	**NE**
Yun, 40	Already networked (AN)			
Park, 37				
Ahn, 23				
Jang, 32				
Choi, 65	Yet to be networked (YN)			
Kang, 60				
Kim, 66				
Seo, 24	Network escaping (NE)			
Im, 27				
Lee, 33				
Han, 25				

Table 8. Emerging traits of participants as they evolve with the EER

Of 11 participants, there were 4 people recruited as the *already networked,* 3 people recruited as the *yet to be networked,* and 4 people recruited as the *network escaping.* The study made sure that the 11 participants were recruited so that they lived in different parts of the city, rather

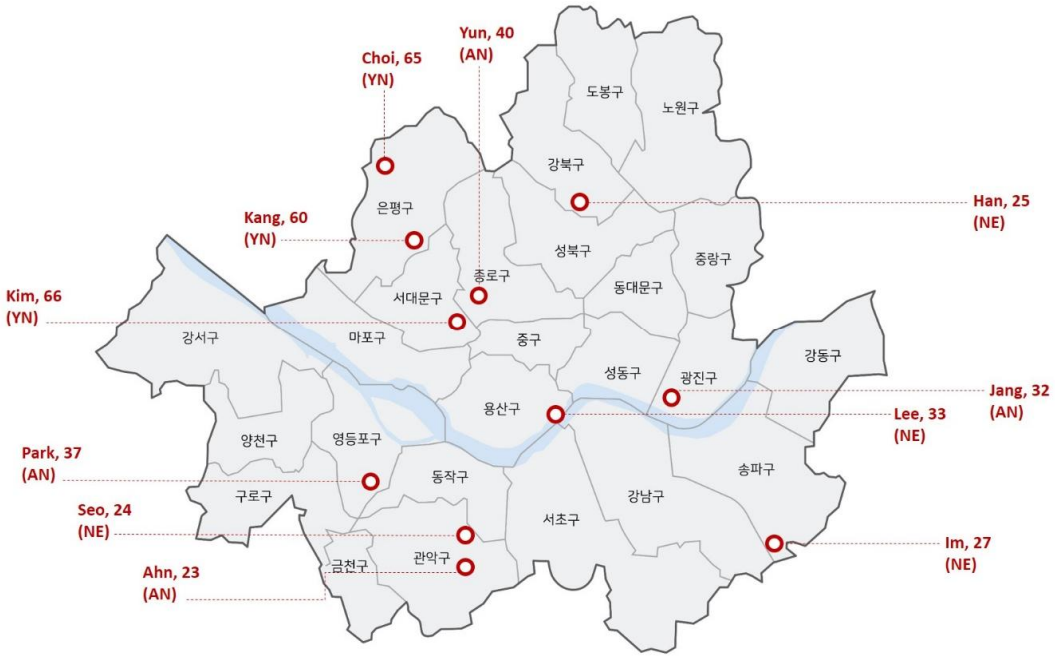

Figure 18. Neighbourhoods in the city of Seoul where the participants met the

68 This process of 'rejecting' a hypothetical group initially uncovered in the previously conducted content analyses demonstrates that the contents of the news media were not taken at face value, but instead were questioned and modified throughout the course of analyses.

than concentrated in one area. All participants participated on sites near where they lived or worked, and at venues that were embedded in their everyday activities in the city (Figure 18).

Results

As shown in respective order, two types of results were prepared for analysis: (1) Codes analysed from the texts produced during the interviews (walking interview and sit-in interview) and from the observation notes; (2) *Coding paradigm* prepared for each participant for revealing the processes of the experiences.

(1) Codes

The final result of the 10 parent codes and 37 child codes are shown in Table 9.

Parent code	Child code		Number of reference
Prosthetic-ness	interface	shortcut	182
		friction	
		always logged in	
		seamlessness	
		compatibility	
	intimate entanglement		
	instant physicality		
	intrudes 'moments' and 'flows'		
	my other self & social identity		
QR Code as Data	imagination	invisibility	138
		unknown movements	
		representing myself	
		major players	
	leakage	fear	
		not knowing	
		given up	
	competence	security	
		accuracy	
	alienation		
Discipline & Control	discipline	gazes	79
		network as Technology	
	control	accessibility	
		lack of Gaze	
	blur between discipline and control		
Posthuman Citizen	unaccomplished		76
	becoming a posthuman		
	accomplished		
Spatiality	linearity & speed		76
	enclosure	incomplete	

		gated Space	
		processing density	
	space as co-constituted		
	re-organised boundaries		
Digital Technology	efficacy	accuracy	72
		transparency	
		lightweight-ness	
	inefficacy	invisibility	
		inflexibility	
		passivity	
	leverage & expansion	evolution	
		fast adjustment	
		creative capacity	
	novelty	awe	
		uninformed	
City Life via Smartphone	indispensable		38
	rights to service		
	quality living		
	competitive edge		
Mobile Bodies	uncertain time-space		33
	mobile number as critical		
	outside the gaze		
	stamped bodies		
Sociality	utilitarian perspective	society that works	28
		for my own benefit	
	reinforced connection		
	structure of vilification		
Network Infrastructure	circle of knowledge		27
	ready networked		
	evolving options		

Table 9. Result of coding using software NVivo 12

Below are the explanation on each parent code as informed by their child codes.

- *Prosthetic-ness* – The intermeshing relationship with one's smartphone was accounted in multiple dimensions. They were mostly described in terms of the experience of the interface. The 'intimate entanglement' (Barns, 2020) was the foundation upon which the relationship was built. Participant attempted to increase their instant physicality with the device for improved experience of the EER, for example, by purchasing a smart watch.
- *QR Code as Data* – While many expressed amazement on the capacity of the QR code for storing and transferring personal data for the whole population, its illegibility and invisibility became the source of anxiety. All participant showed a sense of alienation from the data that they produced for the EER.

- *Discipline & Control* – There were different ways the participants felt or perceived the 'gaze' (Foucault, 2020). Affected by the invisible networks, it did not have to come from a fixed position of a panoptic space. There were different ways of constructing the EER; some were more similar to the conventional portrayal of *disciplinary space*, some were more of a *space of control* (Deleuze, 1992) and most showed a mixture of both.
- *Posthuman Citizen* – Even avid smartphone users noted that they had encountered difficulties when they used the EER for the first time. All had gone through the processes of learning and adjusting their own ecosystems. Those who still found it difficult to use the EER wanted to learn, because they thought the EER was to last longer than expected.
- *Spatiality* – Multiple spatial characteristics emerged, both physically and as perceived by the participants. Particularly during the early phase of the EER, many venues attempted to create an enclosed space. Some participants noted their perceptions of spatial boundaries were reorganised with the use of the EER.
- *Digital Technology* – Digital technology embedded in the EER was discussed often in contrast to the handwritten register. Most admitted that its accuracy and transparency made them feel rest assured about data security, whereas others raised doubt about its operational capacity in making full use of the collected data. How the national population became fast adjusted to this technology was surprising for many.
- *City Life via Smartphone* – Smartphone was considered by all participants as indispensable in leading life in Seoul. Participants found that smartphone has increasingly become the necessary tool to gain access to urban facilities and services, private and public. To take a smartphone with oneself as one left home was a must-to-do even for those who were recruited as the *yet to be networked*.
- *Mobile Bodies* – Differentiated mobile bodies emerged as the participants differently experienced the frictions in their encounter with the EER. Some talked about the increasing significance of mobile phone numbers as the social identifier of the mobile bodies.
- *Sociality* – Some participants, particularly those whose neighbourhoods or workplaces had become a major covid-19 outbreak, talked about the experience of *structure of vilification* (Kim, Y., Chen, & Liang, 2021) Some expressed a sense of stronger social connections with the use of the EER as a 'social contract' for creating a safer space.
- *Network Infrastructure* – Some participants perceive the EER as constructing a circle of knowledge. One chooses to join in order to be informed. Some note how it is becoming

much easier to join the network as convenient alternatives have evolved, such as the rest-assured-phone calls. Many think that the city of Seoul has successfully established this new system because of its well established network infrastructure.

(2) Coding Paradigm

For each participant, a *coding paradigm* was prepared for analysis, for understanding the experiential processes of becoming a posthuman. Figure 19 shows an example of a coding paradigm prepared of Jang, 32 who was recruited as *already networked*. The 11 diagrams are listed in the Appendix.

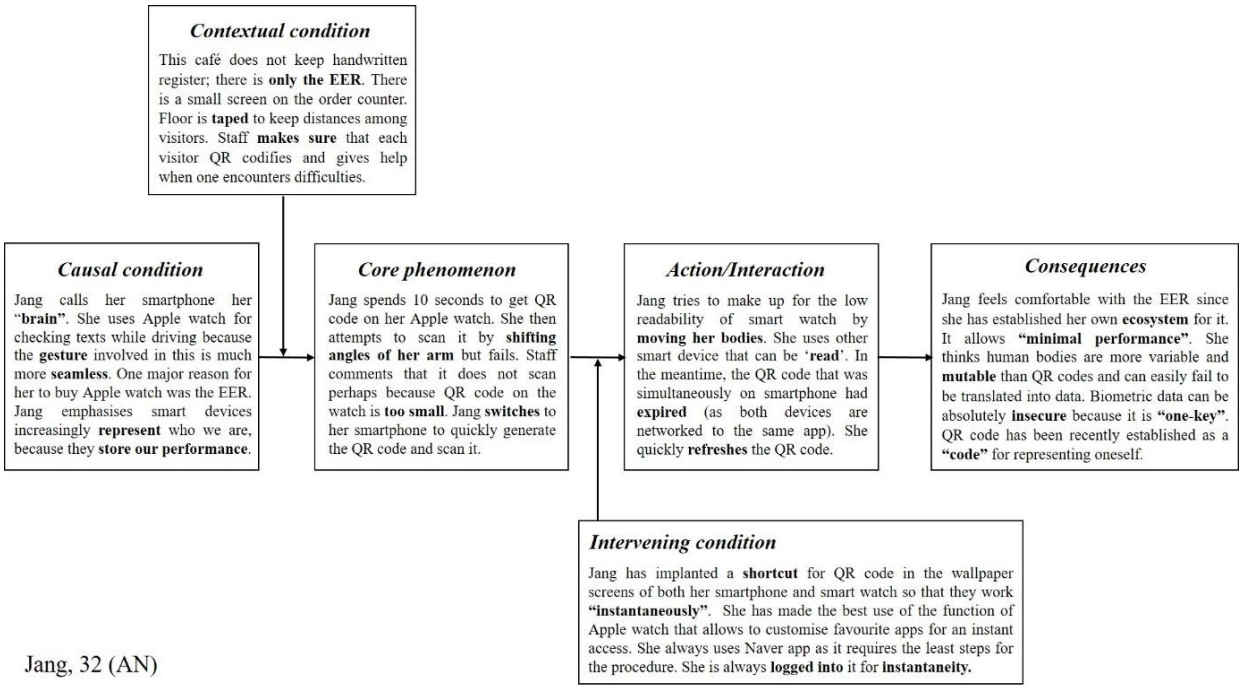

Figure 19. Coding paradigm prepared from field research with Jang, 32

Chapter 4.

Developing Digital Urban Infrastructure

The efficiency of the EER as digital infrastructure lied in the fact that it did not require high technology. The usual 'everyday apps' mostly already embedded in people's smartphones, coupled with one smart screen connected to Wi-Fi was all that was needed to install the system. What became more challenging for the government were the tasks of (1) creating a population of docile bodies capacitated with the right skills to instantly generate the QR codes; (2) securing partnerships with commercial platforms for installing the QR code function in their mobile apps.

4.1. Prototyping and Building Ecosystem

The EER was never introduced as a complete plan. The chronological procedures of developing the system as identified in the content analysis highlight how the South Korean government had strived to grapple with the 'margin of platform indeterminacy' (Mackenzie, 2019)[69]. The EER started as a prototype, many times tested through trial and error. In fact, the process resembles the strategic course of actions often taken by IT platform companies when they introduce new products and services. The materialities of digital technology – interoperability and lightweight-ness – became the core factors for this mode of spatial planning.

Before launching the EER, the government developed an official Electronic Entry Register app (Figure 21) to be used by the venue operators for scanning the QR codes. It was a simple app with a functionality of QR code scan and recording time when the scan happens. Other than developing this app[70], the government relayed all other tasks necessary for developing the

69 The notion of the 'margin of indeterminacy' understands technology as process of becoming: platformising and infrastructuralising processes. (Mackenzie, 2019: 1994) Case studying Facebook (rebranded as 'Meta' on 28 October 2021)'s shift in their programmability, Mackenzie (2019) points out how the company has strived to grapple with the 'margin of platform indeterminacy'. Creating connectivity to perfection is no longer so much of the issues as before for Facebook, but to cope and co-evolve with the open-endedness of a system. Mackenzie proposes this process as an assemblage. It is a way of looking at the coming together of technological elements and leaving the room for alterations and reconfigurations: accordingly, technologies need to be understood "processually, that is, as events rather than objects, as contingent the whole way down […]" (Mackenzie, 2003: 4, original emphasis)

70 The official EER app was also the only software that actually 'produced' new data, that is, the time of entry. The mobile phone numbers, which became another set of critical data, were retrieved from the servers of the platform providers when the need emerged (i.e. when a person is found to be infected or to have been in contact with an infected person)

EER, to other parties: it was the commercial platform providers that embedded the QR code function in their mobile apps and provided their servers; it was the venue operators who prepared the smart devices, set it up in the appropriate place in the venue, ensured network was always provided and the devices were always charged; and it was the visitors who went through a series of steps on their smartphones to generate the QR code and have them scanned. As Kim, Y., Chen & Liang (2021) point out, the EER illustrated "how users and community workers were extended as essential human infrastructures." (Kim, Y., Chen, & Liang, 2021: 3) The configuration of the EER as a system was similar to, for example, how Airbnb (online platform for lodging) leveraged the housing assets of Airbnb hosts, without owning any of the stock.

The chronology of events during the early phase of developing the EER, reveals the flexible modes of forming partnerships with commercial platform providers (top row in Figure 20). Even on the day the EER officially commenced on 10 June 2020, the government had not yet completed negotiations with the candidate platform providers who would agree to install the QR code function in their mobile apps, apart from Naver. Kakao had been negotiating with the government but the negotiation failed (because the government and the company disagreed on which app – Kakao Talk or Kakao Pay – the service should be provided; more on this is discussed in 4.3), only to be resumed on 17 June 2020. Even after the negotiation resumed, both parties could not agree on the duration of data storage until the last minute, to finally agree to commence the service on Kakao Talk on 1 July 2020.[71] Pass, a validation app serviced by the three South Korean mobile telecommunication companies (KT, LGT, SKT) joined on 24 June 2020. Zero Pay, a mobile payment service provided by the city of Seoul[72], joined the league as late as 18 September 2020. The interoperability and programmability of digital technology enabled flexible and seemingly instant 'adding on' of other platforms which in effect, resulted in the expansion of the EER ecosystem.

With such programmability, the EER as digital infrastructure started with minimum requirements for its workings and expanded its scope as it went on being used. Like many digital platforms, problems were solved as they emerged. For example, when people complained about having to go through the personal information consent page every time

71 It also paradoxically illustrates how it actually required very little time for the platform to solve technical issues

72 Zero Pay is a QR code based mobile payment app, serviced by the city of Seoul. With no transaction fee, it aims to benefit the small businesses. Any small business can apply for this service and be sent a printout of a QR code specific to the business.

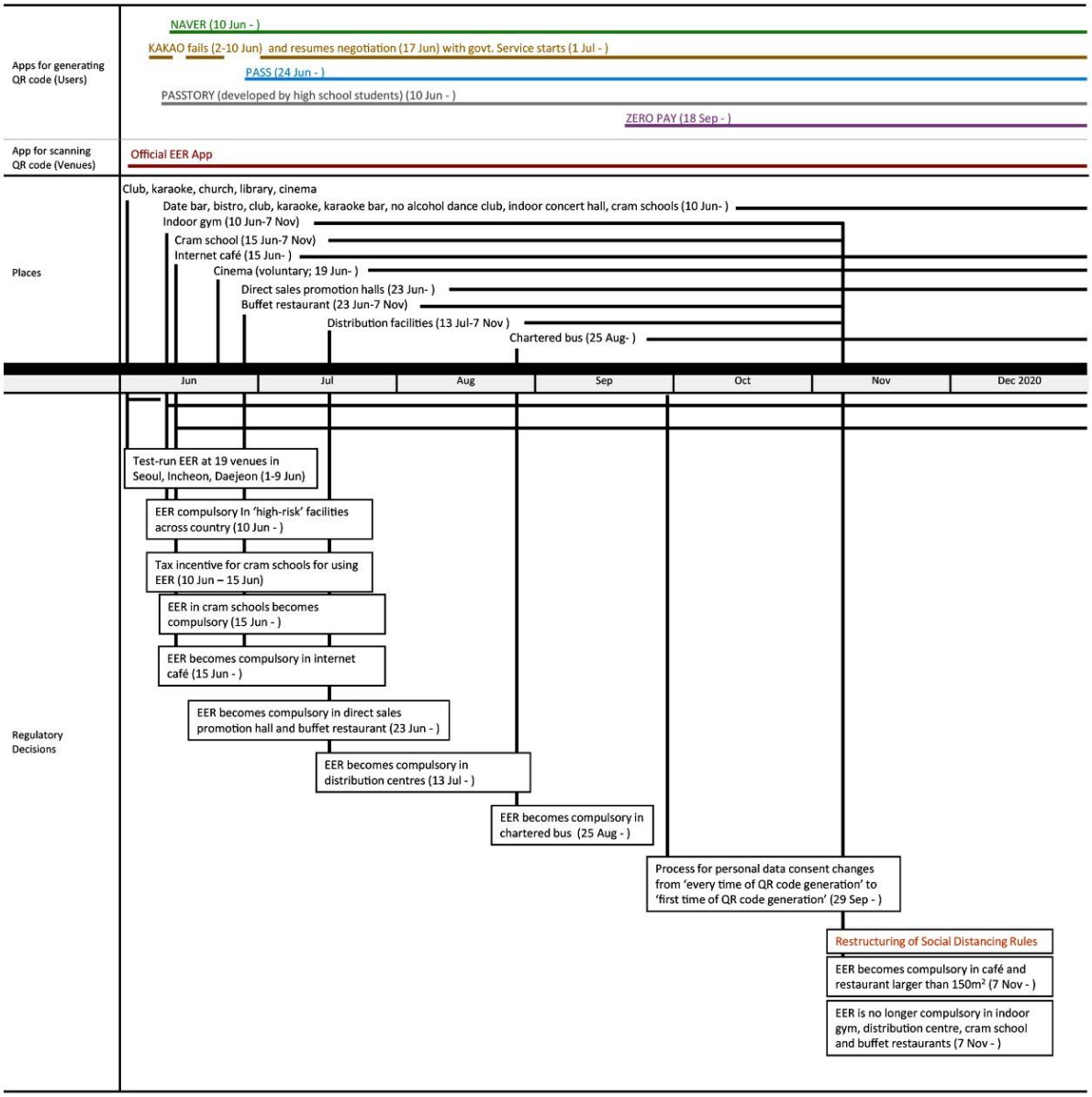

Figure 20. Timeline showing how the EER system evolved and expanded. The chronology of events were as reported by the news media were cross checked with the government reports and briefings.

before generating the QR code, the government brought the platform providers together to agree on simplifying the process.[73] Zero Pay service also came about with ideas from small business owners who suggested to the government to extend the use of existing Zero Pay QR code (that had already been displayed at their cashiers) for the use of the EER. Indeed, the EER was developed like many digital platforms that often start up without a clear idea of what shape

73 Accordingly, the government policy also changed. It now required consent from users only when the user is generating the QR code for the first time, and when it has been more than 30 days since the user has generated the QR code.

it would exactly take beyond the notion of achieving ubiquity. This *adaptive design* was enabled by allowing other parties to 'add on' to the basic structure the government had prepared for its launch.

Its formation is similar to Facebook for example, whose Developer Platform underpinned by API allowed itself to expand its networks and embody 'infrastructuralisation of platforms' (Plantin et al., 2016).[74] As a digital infrastructure, its programmability allowed it to expand across the different kinds of networks and grow its 'ecosystem' of platform providers. The South Korean government "leverage[d] programmability and interconnection to achieve control." (Barns, 2020: 116) Furthermore, like Facebook, the EER decentralised data production – produced at the sites of 318,000 facilities across the country, according to Ministry of Health and Welfare as on 21 October 2020 – yet recentralised data collection. It achieved "rapid network effects" (Barns, 2020: 182). This is what Helmond (2015) and Mackenzie (2018) call *recombinatory governance*. (quoted in Barns, 2020: 131). This in effect allowed the government itself to "remain relatively 'lean'" (Barns, 2020: 44).

This mode of spatial planning and governance was also facilitated by the lightweight-ness of the *dispostif*, which Foucault (2020) points out as the critical characteristic of *disciplinary space*. Indeed this lightweight characteristic played the central role in expanding the EER across the country. As the government ensured, "any smart screen as long as it can be connected to the Wi-Fi" [75] was all that was needed to install the system. For installing the EER, the venue operator needed to download the official EER app called 'Electronic Entry Register' on a smart device (e.g. smartphone, tablet PC, laptop) and place it in the venue.[76] In spite of the researcher's presumption that it should be quite complicated to 'install an IT system', it actually proved to be much simpler than expected; it should be a simple procedure for anyone who is familiar with using mobile apps for their everyday smartphone use[77] (Figure 21).

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74 As API acts to essentially 'open' its software to third-party developers for extension into new service domains (Kitchin 2014; Mackenzie 2018), the EER had evolved in the much same course of growth.

75 Articles including Kim (2020) '[Wise Radio] QR Code Based EER - What is QR Code?' YTN, 12 Jun 2020.

76 The location information of the business venue registered during this process, not GPS, is used for tracking and tracing.

77 The researcher needs to be reflexive with this comment on the easiness of installing the EER app as a person with a moderate level of IT skills. It is acknowledged that unless one is already familiar with the general use of smartphone (e.g. downloading apps, typing in words, and uploading files) going through this process can be difficult. However, considering that 95% of adult population in South Korea own a smartphone (Pew Research, 2019), it is presumed that many more than not, will find installing the app or getting help to install it, not too difficult. For creating this series of screenshots of installation pages (Figure 21), the researcher used her own business registration number to proceed (the details I typed in are erased for presentation). The researcher found the installing and registering as easy as creating an online account for an

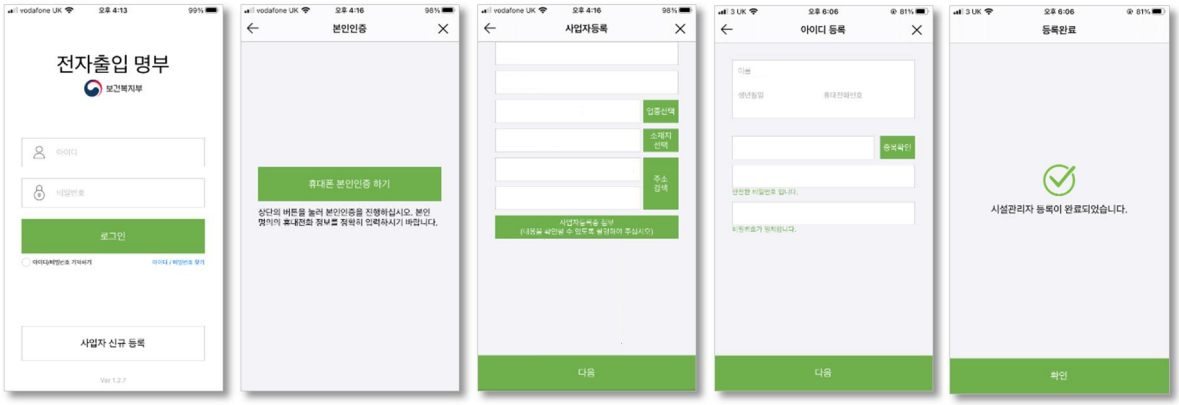

Figure 21. For registering in the EER app, one needs to validate oneself (with codes sent from the mobile telecommunication provider), upload business registration certificate, and create an ID and password.

Although lightweight, they were powerful because once they were installed in the venues across the country, they got activated straight away to become the means for collecting data on the movement of the population. It was indeed "both immense and minute." (Foucault, 2020: 223) As long as one had an access to an everyday smart device and a Wi-Fi, the *mobile dispositif* could be set up whenever and wherever circumstances required, flexibly covering different layers of geographical scopes. This lightweight-ness of the system became the critical asset behind its flexible applicability and expandability – which, in effect, had led to the agile modes of spatial planning and governance throughout the course of the pandemic.

4.2. Creating Data-Producing Citizens

By closely examining news articles in order of dates published, it could be discerned from the content analysis that the development of the EER required, more than anything, equipping the citizens with particular skills of data production. Their bodies were "subjected, used, transformed and improved" (Foucault, 2020: 136) to become disciplined docile bodies capable of producing digital data at the right space and time. As opposed to the spatial imagination where 'human actors are dictated and shaped by preconceived digital environments' (Graham, 2005; Crang & Graham, 2007; Dodge and Kitchin, 2005; Graham, Zook, Boulton, 2013), they were in fact, summoned to become the critical components of the *mobile dispositif*.

electricity provider and uploading the meter readings.

This is discussion is grouped into three phases. The first phase (24 May 2020–10 June 2020) of two to three weeks was invested in introducing the EER as an innovative system that would fix the many problems caused by the downsides of human performances. In the news articles, the mischievous behaviours and imperfect performances, which could be and must be corrected with the use of the digital technology, were repetitively mentioned in order to justify the use of the digital technology. Through the 'structure of vilification' as Kim, Y., Chen & Liang (2021) call it[78], problems that emerged with the use of the handwritten registers such as deceitful behaviours, inaccuracy of written information, and privacy issues were raised. Falsely stating personal information in particular, was consistently condemned for impeding the tracing and tracking efforts by the government.

Such faulty performances, it was claimed, could be corrected with the use of the QR code technology: "This is the countermeasure to the many difficulties the quarantine authority had to face with the significant proportion of false contact numbers in the handwritten registers archived by the club, which eventually became the epicentre of the 'Itaewon club herd infection' last month."[79] "The deceitful cram school teacher"[80] who had lied to the quarantine authority that he or she never visited 'the club' became the most telling example of mischievous behaviour that resulted in the sixth chains of covid-19 infection, ending up with 225 new cases. Figure 22 is a graphic image published in a news article[81] showing how one incident

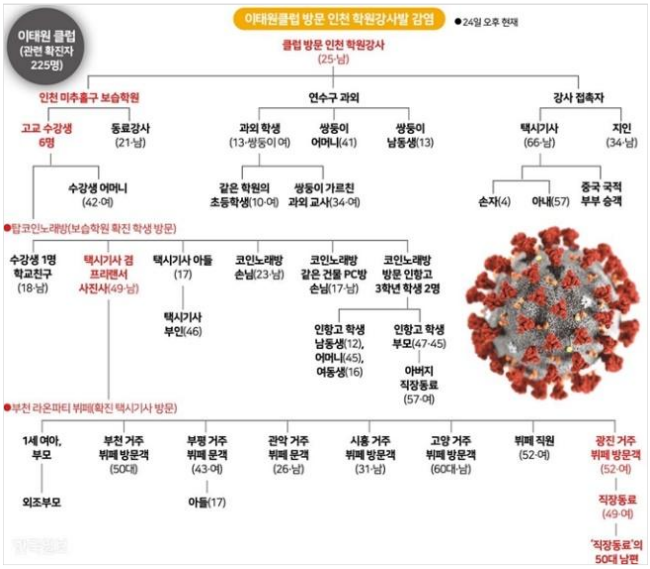

Figure 22. A diagram showing how the corona virus spread from the cram school teacher who lied about visiting a club in Itaewon.

78 According to the authors, normalisation of the Covid-19 apps depended on blaming the 'deviant' individuals, which they call 'structures of vilification'. The empirical evidence from content analysis is congruent with their findings.

79 "지난달 '이태원 클럽 집단감염' 사태 때 클럽이 보유한 출입명부의 연락처 상당수가 허위여서 방역 당국이 역학 조사에 애를 먹자 나온 대책이다." Shim (2020) 'EER Compulsory in Karaoke and Club from Today...Possible with Naver QR Code'. Joongang Ilbo, 10 Jun 2020. Translated by the researcher.

80 "거짓말 학원강사" Lee and Kim (2020), '[Breaking News] Government Announces "Compulsory Use of EER in Clubs and Date Bars" in June'. Hankook Ilbo, 25 May 2021.

81 Lee and Kim (2020), '[Breaking News] Government Announces "Compulsory Use of EER in Clubs and Date Bars" in June'. Hankook Ilbo, 25 May 2021.

of failure in obtaining accurate information due to faulty human performance led to multitudes of consequences. The people indicated in red letters became the next critical links for further infections.

Along with the accuracy of information, difficulties in protecting personal data with the use of handwritten registers were also consistently emphasised (in almost all news articles during this period and beyond). It was explained that these problems could only be solved with the efficacy of digital technology. The government assured that it would do its best to both secure transparency of information and protect privacy of the people."[82] It was claimed that these seemingly contradictory practices – obtaining transparent information and protecting privacy – could only be achieved with the efficacy of digital technology that could separately store different units of data in different servers, only to be re-combined when a need emerges for the government to trace the movements of the individual. The EER was also "expected to be much safer since [the stored data] get automatically destroyed after four weeks"[83] without human intervention, compared to leaving personal details on a sheet of paper that would inevitably be available for the next visitors to read. "The government explains that we can all be rest assured because neither Naver nor the Ministry of Health and Welfare alone can find out where we went."[84] Furthermore, risks of secondary infection through bodily contacts (from the handwritten papers and pens, for example) were also frequently raised as problems that could only be solved by the use of the personally owned smartphones and non-touching ways of scanning the QR code. In this first phase of introducing the EER, the system was conceptualised as a problem solving tool that compensated the apparent weaknesses and flaws of human performances.

The second phase became what the government called "enlightening period".[85] During the second phase of four weeks (10 June 2020– 10 July 2020) news articles came to focus on detailed explanations on how the EER system worked and how to generate the QR codes on

82 "방역과정에서 투명성 확보와 개인정보 보호에 최선을 다하고 있다는 점도 강조했다." Lee (2020) 'Jeong Segyun "Please cooperate in the use of EER in Clubs and Karaokes"'. Seoulkyungje, 10 Jun 2020.

83 "[…] 4주 후 자동 폐기되는 만큼 수기명부보다 훨씬 안전할 것으로 기대된다." Gwak (2020) 'You can also use QR Code for the use of EER in Naver' Hankook Ilbo, 10 Jun 2020.

84"[…] 네이버 혼자 스스로, 아니면 보건복지부 스스로 이렇게 내가 어디로 갔는지, 이런 정보를 알 수 없기 때문에 그런 우려하는 측면은 안심해도 된다, 이런 게 정부의 설명입니다." Kim (2020) '[Wise Radio] QR Code Based EER - What is QR Code?'. YTN, 12 Jun 2020.

85 "계도기간". Lee (2020) "[Breaking News] QR Code EER Collects 6,000 Entry Records during 6 days of Testing'. Hankookkyungje, 7 Jun 2020.

the smartphones. Out of 65 articles published during this period, 35 articles specifically dealt with the 'how-to' of the EER system with visual illustrations. Two kinds of images dominated: (1) diagrams of step-by-step interfaces as shown on the smartphone screens (Figure 23); (2) photographs of two people holding two smart screens and overlaying them for scanning the QR codes (Figure 24). As in the aforementioned example Foucault (2020) gives of the detailed instructions to soldiers for using the rifles (2.4), the step-by-step procedures for generating the QR codes on the smart screens broke down the actions into elements and prescribed the order of manipulation (Figure 23). It should be noted that the same diagrams appeared many times repetitively on the news articles throughout this phase. It constantly exposed a certain sequence of interfaces. Throughout this phase, a particular prosthetic-ness was cultivated.

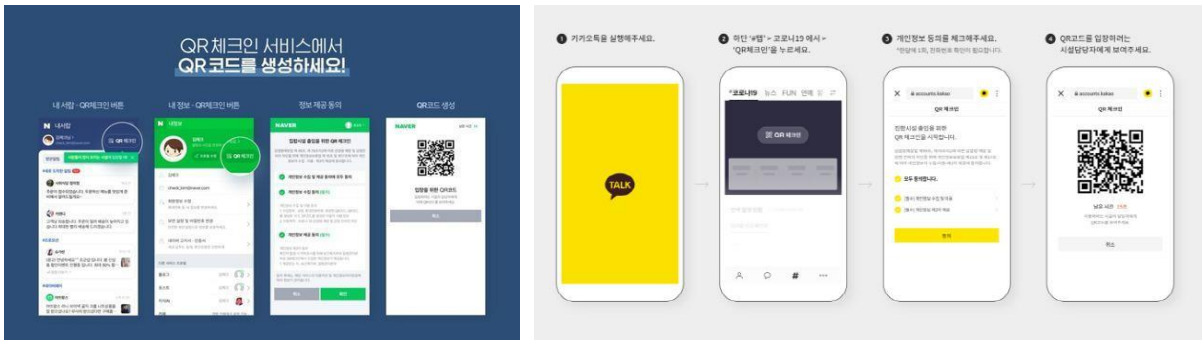

Figure 23. Diagrams showing procedures for generating QR code on smartphones. Neither image has a caption.

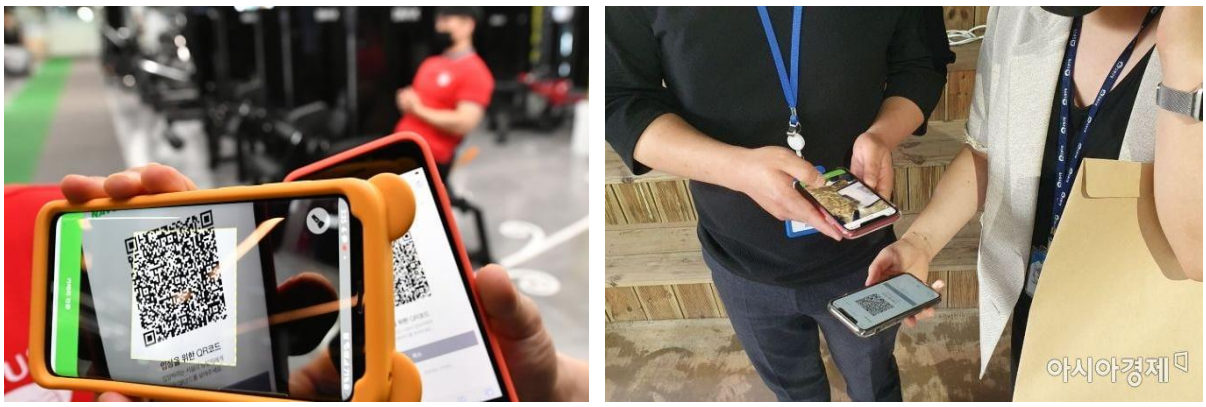

Figure 24. Photographs illustrating how two smart screens should be positioned together in order to scan the QR code.

Moreover, intertextually reading the diagrams proved that these instructions themselves made the procedure appear much easier than it actually was. In fact, in practice, many more steps were needed than the mere four steps shown in the diagrams (Figure 23)[86]. Yet both their

86 Experimenting with the researcher's own iPhone 8, maximum number of 10 steps were required to generate the QR code

explicit tone and underlying nuance were that generating the QR code on a smartphone should be easy and simple. It was also claimed that the once-a-month validation process was as simple as "a few clicks away"; the system was much more convenient than the handwritten register and could be "easily done with Naver"; and all one needed to do was to "just show your phone" with the QR code on it.[87]

Figure 24 illustrates how two smart screens should be positioned together in order to scan the QR code, visually indicating how the mobile bodies needed to manoeuvre to produce the required data. The particular postures and gestures for transmitting data with the prosthesis of the smartphones, as photographed, clearly had the purpose of 'training' (Foucault, 2020) the citizens to into docile bodies with competent digital skills. The relative positions of the bodies – the direction, posture and gesture – were the prescribed conditions of efficiency and competence. Through these visual images, the bodies were 'corrected' to acquire an 'aptitude' or a 'capacity' to produce the digital data in a sequence of timely actions.

It was a process of 'normalisation' (Foucault, 2020). In effect, the QR codes that these docile bodies produced, reduced themselves into "objects of knowledge" (Foucault, 2020: 28). The QR codes reconstituted the bodies into measurable and calculable units to make them locatable and countable. While the individuals holding smartphones and looking at the QR codes (Figure 24) have the capacity to produce the data, they do not have the capacity to read or interpret them. The QR codes were not legible to them and could only be read by the digital imaging sensors; and they could only be managed and destroyed by the digital technology itself. This configuration produced one-sided visibility which structurally resembled the imbalanced power relationship embedded in the "eyes that must see without being seen." (Foucault, 2020: 171)

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with the Naver app depending on (1) whether one's smartphone was already switched on or activated, (2) whether the smartphone was already unlocked, (3) whether one had been in the midst of doing something else using the app (e.g. searching for weather) in which case you needed to come back to the main page, or (4) whether one was already logged into the Naver app. For those using software versions of, and earlier than Android 5.0 or iOS11 needed to (5) click the 'three lines' icon before (6) clicking 'My Profile' button (for software versions of and earlier than Android 5.0 and iOS 11) or clicking 'My Drawer' button (for software versions later than Android 5.0 and iOS 11) on the top right corner of the screen and (7) click the 'QR Check-in' button. If you used the QR code function for the first time or if it had been more than 30 days since you last validated (8) you had to validate yourself with your smartphone numbers with the code sent by your mobile telecommunication provider and (9) click the 'QR code' button. If it happens that the QR code generated did not get scanned in 15 seconds you needed to (10) click 'Regenerate' button to refresh the QR code and have it scanned.

87 Articles including Park (2020) 'QR Code EER in Karaoke, Easy with Naver', Chosunbiz, 10 Jun 2020; Lee (2020) 'Naver Participates in the Quarantine Efforts with QR Code EER', Asiakyungje 10 Jun 2020; Kim (2020) 'Use Naver QR Code EER in Karaoke and Bars', Heraldkyungje 10 Jun 2020.

The third phase (7 June 2020– 27 September 2020) emphasised socialisation of the EER by showcasing best practices and good conducts performed by accomplished posthuman citizens. It was a period of 'strengthening' the linkages between the actors and actants in the

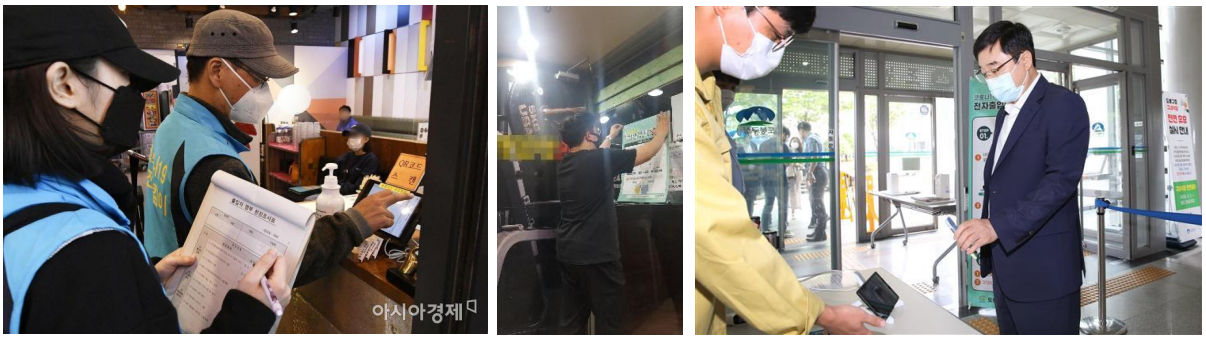

Figure 25. A civil servant rounding the neighbourhood for checking on the EER. Paper she holds is titled 'EER Field Inspection' (left); A civil servant of Gangbuk borough puts up an EER instruction poster on a local indoor gym (middle); Head of Dobong borough demonstrating his good conduct (right)

Figure 26. A churchgoer showing the QR code on her smartphone screen (top left); A kid wearing a face mask and a pair of vinyl gloves performs the QR codification with his smartphone before entering an event (top right); A person in her face mask registers her entry with the QR code at a public facility (bottom left); A screen shot of a news broadcast clip showing a person working out his QR code at the entrance of a karaoke (bottom right)

assemblage. Good practices by the local governments were often explained in detail with

enlarged photographs taking up a significant proportion of the space in the articles. (Figure 25)[88] Many articles reported on how the local governments employed various communication methods to bring the citizens together, "doing whatever it takes to have the EER system settled"[89] in the local area. The local government also cross checked online to see if all business registration numbers of 'high-risk' venues were registered in the official EER app. For those that were not yet registered, a civil servant visited them even at night, to ask for cooperation (Figure 25, middle). Photographs of ordinary citizens were also published to show their good will (Figure 26)[90]. They confidently hold their smartphones in the process of producing the QR code. Since a photograph as a medium, more often than not, is believed to be a true reflection of reality, the power of repeated use of similar photographs discursively contributed to the naturalisation and socialisation of the EER.

Examining the developmental phases of the EER revealed that the government had put into much efforts to create a population with capacities to produce the required digital data. The docile bodies of the citizens holding their smartphones demonstrated their actions that enacted the *mobile dispositif* real-time. The human downsides and the weaknesses were criticised as the main 'problems' that needed to be corrected by the efficacy of digital technologies. For this, the government imposed microphysics of power over the surface between the bodies and the smartphones (Foucault, 2020); such process of training the bodies into data-producing citizens itself became the process of 'building the digital infrastructure'.

4.3. Networking Population on Commercial Platforms

This section discusses how the South Korean government had strived to secure its networked population on commercial platforms. As previously noted, the government chose to request the major South Korean IT platform providers, Naver and Kakao, to embed the QR code function

88 Image extracts are from Kim (2020) 'Covid-19 Safety Guard Checking on the EER at a Restaurant' Asiakyungje, 19 Nov 2020; Hwang (2020) 'Gangbuk Borough Checking on EER at Local High-Risk Facilities' Seoul Shinmun, 19 Jun 2020; Yun (2020) 'Dobong Borough Office and Community Centre Adopts EER' Seoul Shinmun, 8 Jul 2020.

89 "조기정착 총력'. Park (2020) 'Gangbuk Borough Goes out Field to Check on Use of EER in High-Risk Facilities'. Asiakyungje 19 Jun 2020.

90 Image extracts are from Lee (2020) '[Breaking News] QR Code EER Collects 6,000 Entry Records during 6 days of Testing' Hankookkyungje, 7 Jun 2020; Oh (2020) 'Covid-19 EER Simplifies Process on Agreement on Sharing Personal Information from 29th' Jeonja Shinmun, 27 Sep 2020; Park (2020) 'Gwangjin Borough, Adopts QR Code EER for Welfare Facilities' Asiakyungje, 24 Jun 2020; Lee (2020) 'QR Code EER Becomes Compulsory at Cram Schools and Internet Cafes in Metropolitan Areas' YTN, 12 Jun 2020

in their mobile apps, instead of developing one itself. In effect, the government 'borrowed' the ready-made populations of the platform providers to speedily build its own networked population. The decision was made on the following reasons.

Firstly, it was the *online human traffic* that the commercial apps already had, and which was difficult to create from scratch. Data are both "delivered and generated through apps" (Rose et al., 2020: 2), yet creating a mobile app that holds a significant proportion of the national population is a time-consuming and difficult task. In fact, there is just a few mobile apps which has almost monopolistic share of a national population (e.g. Naver, Kakao in South Korea) or global population (e.g. Google) as their customers; the level of 'ubiquity' achieved by these apps itself is their competitive asset. The government had initially asked the two major IT platform companies with largest market share in the country for their collaborations: Naver and Kakao. As the government officials were quoted for their efforts to invite these companies, Naver was claimed to be the "Nation's 1st internet company"[91] and "even older adults who often find IT difficult are familiar with Kakao Talk"[92]. Naver had its largest user volume in its portal app 'Naver' and Kakao had its largest user volume in its messenger app 'Kakao Talk'.[93] What differentiated 'Kakao Talk' from 'Naver' was that as a messenger app, the users were usually always logged into the app, "making it easier for the elderly who tend to find logging in on spot rather difficult."[94]

Secondly, these commercial platform providers had in store the most updated version of the crucial data: the *mobile phone numbers*. It was not the names, but the mobile phone numbers that became critical data in tracing and tracking the mobile bodies. This is also illustrated from the fact that handwritten registers required visitors to write down the time of entry and mobile phone numbers, but not names.[95] Yet it was likely that the government did not always hold the most updated mobile phone numbers of its population, because mobile phone numbers tended to be updated more frequently (e.g. changing mobile phones often leading to changing the numbers) than the residential records which got reported mostly only when people moved into

91 Gwak (2020) 'You can also use QR Code for the use of EER in Naver'. Hankook Ilbo, 10 Jun 2020.

92 Kim (2020) 'Is KaTalk joining EER?...Kakao is "Discussing it with Government"'. Joongang Ilbo, 16 June 2020.

93 IGA Works (2020) 'Naver vs Kakao, Comparative Analysis of Mobile App Usage'. (https://www.igaworks.com/). This report analysed 1.7 billion data retrieved from 35 million Android OS mobile devices during the month of June 2020.

94 Park (2020) 'Following Naver, EER Expands to KaTalk and Pass'. Chosunbiz, 19 June 2020.

95 Initially, personal information visitors were required to write down in the handwritten registers included the time of entry, name, and contact number. However, with privacy issues raised, 'name' was no longer required from 11 September 2020. Mobile phone numbers as data became the most critical data in identifying human (and viral) mobility.

a new residential address. On the contrary, Naver and Kakao with their provision of everyday services including online shopping, online reservations (for offline services such as restaurants, hotels, hospitals, workshops, museums, exhibitions, hairdressers etc.), and mobile messenger services (which for creating an ID, validate the user with the mobile phone numbers) were much more likely to have in store the updated mobile phone numbers of the national population.

Thirdly, these apps were immersed in the everyday lives of the South Korean people. Out of 51 million national population, more than 42 million users were on Kakao Talk for 20.9 minutes every day on average, longer than any other app. Around 36 million users were on the mobile app Naver for 17.7 minutes every day.[96] As one of the critical conditions for the tech-solutions to be effective for tackling the spread of covid-19, Kitchin (2020) indicates that 60% of the population need to participate in the contact tracing, which he believes to be unlikely to be achieved. (Kitchin, 2020: 375) Yet the mobile apps Naver and Kakao Talk were already deeply infused in the everyday activities of the 95% of adult population in South Korea who owned smartphones – for talking to friends, shopping food, finding routes, writing emails, making reservations, asking questions, finding real estates, watching television, reading magazines, checking stock prices and much more – which strategically established a good starting point for the everyday use of the EER. In other words, the power of everyday engagements with these mobile apps were relayed to the use of the system that the government had created. The choice by the South Korean government to tackle the most popular mobile apps in the country to establish its networked population in the shortest period of time possible, was in the least effective (rather than creating a new app and expecting the whole population to register).[97]

This analysis also exposed the asymmetry in the capacities between the commercial platform providers and the government in data production, access and utilisation; which implied certain socio-spatial and political consequences. The process whereby the platform company Kakao and the South Korean government had conflicting ideas on which of Kakao's

96 WISEAPP (2020) 'Apps used for longest hours by Koreans', published on website www.wiseapp.co.kr, accessed on 25 March 2021. WISEAPP, a market analytics company, reports app usages of South Korean smartphone users (Android & iOS) aged more than 9 years old in the month of November 2020. 42,230,000 people used Kakao Talk app for 26.5 billion minutes in the month of September 2020. This was roughly 20.9 minutes per user per day. 35,700,000 people used Kakao Talk app for 19 billion minutes in the month of September 2020. This was roughly 17.7 minutes per user per day. According to UN, population in South Korea is estimated at 51,269,185 people at mid-year of 2020. https://www.worldometers.info/world-population/south-korea-population, accessed on 25 March 2021

97 As a comparative illustration, in Singapore only 17% of the population had installed the government-developed TraceTogether app after a month of its launch. (Vaughan, 2020)

apps the QR code function should be embedded, illustrated the different motivations and presumptions a government and a commercial company could have in developing a digital system. News articles published as early as 27 May 2020 (two weeks before the official commencement of the EER) reported that Kakao was likely to join the EER and was in the process of discussing the terms with the government; and they were going to have the QR code function embedded in the 'Kakao Pay' app as quoted by the member of the Kakao Team.[98]

However, on 10 June 2020, the day the EER officially launched, it was reported that government had failed negotiation with Kakao after all, because they disagreed on which app the QR code function should be embedded. The government wanted the Kakao Talk to have the QR code function because it was an app with the largest online traffic with the highest user volume (as explained earlier). Kakao, on the other hand, wanted to have it on Kakao Pay, a digital wallet app, which they had more recently launched. It had far less number of users (20 million as in June 2019) but had the QR code function already embedded in the software for its payment and transaction service. Kakao Talk was also claimed to have some technical issues with the duration of data storage; as a messenger service it only stored data for three days which was much shorter than the duration of four weeks the government wanted for the EER system. Some also suspected that Kakao was taking this opportunity to expand their user volume for 'Kakao Pay'[99]. However, on 17 June 2020, Kakao requested to come back to the negotiating table, with a revised plan for solving technical issues to embed the QR code function in 'Kakao Talk' which the government favoured. Kakao Talk commenced its QR code function for the EER on 1 July 2020.[100]

One cannot not be entirely sure if it was purely the technical issues or ambition for the user volume of the digital wallet app, or a mixture of both, that made the company leave the

98 Baek (2020) 'Kakao Following the Suit of Naver to Join the EER'. YTN, 27 May 2020; Park (2020) 'Kakao Pay Joins the EER for Use at Clubs and Date Bars'. Chosunbiz, 27 May 2020.

99 Kim (2020) '[Wise Radio] QR Code Based EER - What is QR Code?'. YTN, 12 Jun 2020.

100 Kim (2020) 'Is KaTalk joining EER?...Kakao is "Discussing it with Government"'. Joongang Ilbo, 16 June 2020; Kim (2020) 'Will Kakao Talk Have EER... "Solving Technical Issues"'. Chosunbiz, 17 June 2020; Lee (2020) 'Kakao Talk Will Have EER QR Code'. YTN, 19 June 2020; KBS (2020) 'Kakao Will Embed EER QR Code in Kakao Talk'. KBS, 19 June 2020; Park (2020) 'Following Naver, EER Expands to KaTalk and Pass'. Chosunbiz, 19 June 2020; Gwak (2020) 'EER QR Code Possible in KaTalk and Naver'. Hankook Ilbo, 19 June 2020; Park (2020) 'KaTalk Commences QR Code Service…EER is On Its Track'. Chosunbiz, 1 July 2020; Jeong (2020) 'Kakao Talk Starts EER QR Code'. Ajukyungje, 1 July 2020.

negotiating table in June 2020. Yet the possibility of their "market-making objectives through the mechanism of surveillance capitalism" (Zuboff, 2019, quoted by Kim, Y., Chen, & Liang, 2021: 4) cannot be all together disregarded. There are two more clear points that could be made about this episode though. Firstly, it showed that even small decisions made in contingent manners could change the mechanisms of digital mediations in urban spaces. The episode illustrated that how such seemingly insignificant technical issues such as the duration of data storage and the status of an existing QR code function (because Kakao did in the end sort them out in a few days), could become an important factor for an IT company in their service designs; which could determine the entire landscape of a system that involved the whole population. Had both parties agreed to use 'Kakao Pay' for the EER system, there is no doubt many more citizens as consumers should have started using the digital wallet (considering many business venues tend to have their screens for the QR code scan, on their cashier tables).

Secondly, it also highlighted discrepancies in the motivations the government and the company had for creating a digital system. For the government, the existing volume of human traffic that simulated a networked population as fast as possible was critical, whereas for the company, it was not their priority. Building smart cities often involves partnership with private companies, so such differences in their motivations can lead to various social and political consequences. This episode demonstrated that such disparities in their motivations indeed should not be neglected in the theories and practices of the discourse. In particular, the fact that the company asked to resume the negotiation showed how this was not a losing game for the commercial company. In the end, the covid-19 pandemic had given both Naver and Kakao an opportunity to have almost all South Korean population registered as their customers.

The South Korean government's decision to network its national population on commercial mobile apps illustrated the difficulties of building a networked population. It first showed that securing an online platform with a significant proportion of national population became the necessary condition for materialising the urban assemblage operating on the production of digital data. Secondly, it implicated that more than anything, creating a smart city may require a platform to which every citizen is always readily networked. And this could impose a major obstacle for democratic societies.[101] Reflecting on the difficulties the government went through for ascertaining it, it could be said that the task of creating a networked population is perhaps

101 It is also ironical that the South Korean government made use of the pool of customers retained by big commercial platforms, which are often criticised for their monopolism.

too often taken-for-granted 'as already given' in the discourse of smart city. This case study showed that it could be the opposite.

4.4. Core Components of Digital Infrastructure

Digital infrastructure was conceptualised in Chapter 2 as built digital networks that facilitate flows of resources, good, and people; in so doing, it produces, processes and reproduces digital data. The concept of *mobile dispositif* revealed useful for conceptualising the fluid coming together of the mobile bodies and objects that were necessary for producing the EER, particularly when circulation, the essential condition of a city (Foucault, 2007), became both a problem and a solution in this pandemic.

On top of the discussions in the previous sections which primarily referenced findings from the content analysis (i.e. from assembling, structuring and entrapping point of view), this final section brings in the accounts from the field research to enrich the discussions of the three core components of digital infrastructure uncovered in this case study. They are the urban screens, the posthuman performances and the leveraging effects of digital technology.

Urban screens

Verhoeff (2017) asserts that *mobile dispositif* in today's urban space is ultimately a screening arrangement. Yet understanding its spatiality becomes ever more complicated as these 'urban screens' are not necessarily positioned in fixed ways, but also move *along* with the bodies. The portable screens attached to the bodies as their prostheses, move and perform with the bodies. As Im, a 27-year-old part-timer at a distribution centre and Seo, a 24-year-old university student revealed in the field research, urban screens determine the specificities of the physical set-up for interaction and enact spatial boundaries. For example, Im said that the physical walls of the warehouse he was working at were no longer so meaningful, because where the EER was situated – in his case, in the hands of his employer – came to reorganise where the entrance was. (Munster, 2006)

Urban screens as actants in this assemblage of the EER indicate the material flux of digital infrastructure. Indeed, understanding these screens as *process* (rather than objects) (Verhoeff, 2017) bring them forward as the movable nodes at which circulations are made; as the hardware, the software and the interactions are assembled at the sites of these screens. In so doing, it

displaces existing markers of separation. As Im and Seo pointed out, the "[w]alls are no longer walls" (Verhoeff, 2012: 114).

Seo noted that existing spaces were reorganised and redefined depending on where and how the EER was placed. He was answering to the question during our sit-in interview, 'if possible to imagine such a thing, where did you feel the spatial boundaries were when you were using the EER?'

Seo	Um……as we are supposed to stamp for the EER, you know, some places are loaded with the EER [settings] and some have just one screen in one building. In this Café Ediya, we have one [screen] here. And there is also a building right beside this place, you know……So my perspective is that they [the spaces] are divided according to [the spatiality of] these stores, the business units.
Researcher	Oh, then for example, if there is just one EER setting at a big building, it constitutes a far bigger space, and if the spaces are divided in smaller parts as it is here, the space is constituted according to the divisions among these stores……that kind of image comes to you.
Seo	Yes.

Seo was saying that as the EER was stationed in each store, the spatiality of each as a 'business unit', had become further strengthened than before. If there is just one screen at the entrance of a building of 300,000m^2 gross area where 1,000 people come and go, for example, the particular location of the screen becomes the spatial node where this volume of circulations is created. If there is one screen at a small room of 10m^2 where just 5 people come and go, that is the scale of its node. The fact that these screens can be removed anytime and be located elsewhere highlights the liquidity of these spatial organisations.

On top of this, interaction with these screens become increasingly critical. The spatial arrangements of the EER evolved so that the designated screens react better for the human actors. According to Jang, a 32-year-old designer, in Gangnam neighbourhood of the city – "where businesses do well"– the commercial venues had created a spatial arrangement that 'read well'. Jang explained,

Jang	Um……I think it's mostly in Gangnam area, where businesses do well…… as people use different devices with all different directions of screen faces, they [the businesses] have set up the scan [surfaces] in three dimensions. Have you been, have you seen?

Researcher	No, I haven't
Jang	For example, as you can see, this Starbucks café has its iPad out just like that. But they [businesses in Gangnam] have three screens; one straight on the table, one up there [in the air above the table], (with the gesture of moving her hand up and down to explain the perpendicular surface) and one like this. Then the customer can hold [the smartphone] this way, or that way, or even that way……
Researcher	Oh……I see. So people could more easily, they could have their bodies in any direction, so that they could……
Jang	Yes. Correct.

Jang was explaining this phenomenon straight after her attempts to scan the QR code with her Apple watch. The attempts failed either because the screen size was too small according to the staff member, or because the angle of the screen on her Apple watch could not easily be aligned with the designated screen, according to Jang herself. Whichever was the actual reason behind this malfunction, Jang said the screen setup in the restaurants she visited in Gangnam neighbourhood instantly responded to the QR code on her Apple watch in any possible angles. The 'three dimensional screen' arrangements as explained by Jang, created an urban surface that aptly responded to their customers' bodily movements. These spaces completed their visitors as competent posthuman citizens who moved faster and more efficiently as a result.

Deleuze and Guattari emphasised the 'circulatory conduit' as always material. (Deleuze & Guattari, 1997) The participants' accounts discussed thus far affirm that the urban screens as the 'interactive walls' reorganise the existing perceptions of spatial boundaries. Their significance lie in the fact that the screens themselves are mobile. They create new urban sociality by creating nodes that channel the movements of resources and knowledge, while it is itself in flux and never fixed. The materiality of the urban screens is that it is a temporary node that responds to the mobile body's actions to produce and circulate digital data. As results, they replace the conventional roles of the walls and reorganise the boundaries, sometimes to "compress" (Park, 37) and sometimes to "divide" (Seo, 24).

Actors

Human actor's performance of producing the digital data in timely manner itself became critical in enacting the EER as an urban assemblage. The system was incomplete unless the

citizens of Seoul *became* the agencies that link other actors and actants in the constitution of the urban assemblage. Just because the government announced the commencement of the EER, the urban space would not automatically become digitally mediated. As it was as well demonstrated in the findings from the content analysis, the government had put in much efforts in creating docile citizens capable of producing the required digital data (4.2). The results from the field research on the other hand, reveal the glitches and frictions experienced by the actors. Han, a 25-year-old professional runner described the early scenes in the clubs she visited; it illustrated that the people *themselves* then were one of the biggest frictions in the construction of the assemblage.

> In the club, it was all the QR code then because it was the early days.[102] So there were delays. Some couldn't have the QR code recognised, some had to sort out how far or how close they had to hold their smartphones to the screen, some had not have the QR code registered, you know, the phone number validation stuff, so it took much time, you know, validating your phone number and having to type in the validation numbers […] it was chaos. And also (laughs) some people just sneaked in, you know, saying they can't afford to get caught, can't afford to have their boss find out and so on (laughs). People were like that.

Han's portrayal of the club scenes made a stark contrast with what the researcher had been witnessing during the field research and her everyday life in Seoul after the 14 months of using the EER. Jang also noted that in the earlier times, there was always a staff member solely committed to the EER in the Starbucks café in her neighbourhood she frequented (and where we did our sit-in interview as well), always standing by the EER setting near the entrance to help and make sure that all the visitors produced the QR code before coming into the place. When we visited the place on 26 August 2021, there was not a staff member standing by. The café did not even keep a handwritten register and there was only a palm sized screen on the order counter. Jang also commented that in the early days, people in the queue for the EER were sometimes too slow in their manipulations for generating the QR code, so she used to just go over to the table to handwrite the register (where they were available) since that was much faster. It took some time for the citizens of Seoul to become docile bodies capacitated with the

102 Han is referring to the absence of the 080-Restassured-phone call method for checking in, which was introduced early November in 2020.

ability to instantly become the working *networks* themselves that "make things move […]" (Rose, 2016a)

It should be noted that it was not necessarily due to their lack of IT skills that it required certain amounts of time for them to become performing actor that enact the linkages in the assemblage. Im's anecdote showed the need for 'training' or socialisation before becoming a docile body. Im, 27, was an avid smartphone user, but had no idea what it meant when the storekeeper told him to 'stamp'[103], when he visited a restaurant with a friend straight after being discharged from the compulsory military service.

Im	I enlisted in the army in December 2019. After three months in the army, oh, this covid-19 pandemic got really serious, as in, you know, in the city of Daegu.
Researcher	Oh, (laughs) you were in the army then.
Im	Yes, leaves were all cancelled…….so I came out after some time. I mean, I was cut off from the society, and there I was. The first time, you know, you meet people, I still remember, we went to this chicken barbeque place in Shinlim neighbourhood, and yeah, he [the storekeeper] told me to stamp. I was like, "Stamp what? Stamp what?" And he goes "This. Stamp this." I was like, "What?" (laughs) I just didn't know what it was. All this time, I wasn't allowed a leave……that was in 2021, the first time out of the military after [I enlisted in] 2019. I had no clue what to stamp.
Researcher	That is really interesting.
Im	I was with my friend, she did it for me and told me, "you have to do this these days" (laughs) Gosh, she just shook her mobile phone twice[104], and there it [QR code] was.

Im's description of his surprise at her friend's performance of 'shaking the QR code out' showed how in fact, such performance could be novel and amazing to someone who had not heard about it or seen it before (even though that person was an avid smartphone user). During the period of 18 months[105] he was "cut off from the society", he was not exposed to the digital

103 The research participants mostly used the word "stamp" in Korean to describe the act of scanning the QR codes for the EER. This word is obviously easier to say in Korean than the word 'scan'. It also implies an action of validation.

104 The 'shake function' for generating the QR code is discussed in more detail in Chapter 5.

105 Conscription in South Korea requires male citizens between the ages of 18 and 28 to perform compulsory military service. The period of service for the army is 18 months.

mediations other citizens were practicing. This anecdote reveals that becoming a docile body capable of, and willing to produce the required digital data was indeed a prerequisite before activating the linkages with other actors and actants in this urban assemblage.

Willingness to produce the digital data was indeed critical in the construction of the EER. This was also supported by the perceptions some of the research participants expressed. They said that the main reason they chose to generate the QR code was to *remain* in the circle of knowledge. The digital infrastructure had been keeping its shape *because* the actors were motivated to sustain it. Park, a 37-year-old employee at a pharmaceutical company, said that although he did not like doing the EER, he felt he needed to do it because he wanted to remain in the circle of knowledge; so that he could be informed, just in case the virus broke out around him.

Park	I don't like doing it [EER] but then, yeah, I should.
Research	Why should you?
Park	Just in case, the tracking, you know, for later……there are many new cases in my workplace……because there are many new cases……so……just in case.

Park said that he felt he had to conform to produce and reproduce the digital infrastructure, in order to remain in it. The participants indeed conceived the EER as an "apparatus of knowledge." (Foucault, 2020: 126) Producing the QR codes whenever and wherever required was the way to be in the circle of knowledge production and to be 'in the know'. Production of digital data was the only way to be included, or 'incorporated' into the infrastructure.

Jang, 32, said that during the early phase of the pandemic, she never wrote her mobile phone numbers in the handwritten register as true, by changing the last digit. She did not join the digital infrastructure because she did not care to be given a response from it (especially the spam calls). As the situation around the pandemic got worse, she started to write her phone numbers as true for the handwritten registers and made sure she 'stamped' where the EER was available, because she wanted to join the circle of knowledge. Jang talked of a sense of relief.

> Of course in the early days it was cumbersome, actually. But then now it gives me more of the sense of security? Or relief? Checking and registering mean leaving people's traces, so just in case, I could be contacted or informed if my traces had overlapped [with the infected]. As I could be assured of my traces. […] As you know, it was not too bad until

> April and May in Seoul so we just roamed about? So……yes, so……I hoped then they didn't call me, but now I hope they do (laughs).

Coordinating for the EER meant becoming part of the "apparatus of knowledge." (Foucault, 2020: 126) One could always opt out, but Park and Jang (and others unquoted in this section) reasoned that they would rather be in the circle of knowledge production in order to be informed. They were aware that the necessary condition to do so, was to produce the digital data themselves. In this sense, how Cresswell (2010) depicted the mobile bodies as moving "along routes and conduits often provided by conduits in space." (Cresswell, 2010: 24) appears to be just one part of the story. The mobile bodies in this case study had to *enact* the conduits themselves by producing the digital data. 'Mobile bodies' as a concept is central in this, because the very movement of the bodies largely determined where, when, and how the assemblages were made.

Leveraging effects

When the participants were asked the question if they felt the EER by now had well settled in the city of Seoul, all said they felt it had quite well settled in. When further asked if the span of time taken for this maturation – which was around over a year – felt short or long, all but one[106] said it had been a short period of time for a novel system such as the EER to be so quickly settled in. Regardless of the hypothetical groups they were recruited for, there was no big gap in their opinions on the fast speed of adaptations the citizens of Seoul had demonstrated throughout the course of the 14 months. Almost all participants said that they were now familiar with the EER; while the elderly participants still expressed some anxieties, they said they were far more used to it by then. As Kang, 60, pointed out the technology that was once encountered as "amazing" soon had fast become mundane as people came to be adapted to it. As Kim, Y., Chen & Liang (2021: 16) also witnessed, a year and a half later after the first outbreak of the covid-19, the EER in South Korea had shifted from innovative to mundane, from an emergency practice to a routine. (Kim, Y., Chen, & Liang, 2021: 16)

According to the participants' opinions, one of the reasons the EER could be mobilised in such a speedy manner was because South Korea was a highly developed 'information society'. EER was a particular concretization of the network assets the society already had.

106 Lee, 33 said "it has taken time as much as it should."

> It was fast. South Korea is an information society, it is very well networked, and telecommunication networks are remarkably well established. And also we were in a hurry, so we had to be quick. That is how [the EER was adapted in speedy manner] (Park, 37)

> Um……we have a very high penetration rate of the smartphone, and also high penetration rate of the internet……and that worked quite well mutually……..people are familiar with it, so people use it more easily. (Seo, 24)

As the participants pointed out, the reason the EER as an urban assemblage could be so quickly mobilised and naturalised was because people already had a high level of prosthetic-ness to the smartphones and had readily been connected to the internet. When asked the question, 'how is your smartphone's network connectivity?' during the walking interview, no participant said he or she had a problem with the networks (in fact, some looked curious to be asked such a question). The EER was a particular urban assemblage or formation that was actualised from the existing urban network assets and it did not require building a new stuff. It required a new way of using the already available technologies. The population mostly owning the smartphones and readily connected to the networks became the very foundation upon which this urban assemblage could be speedily geared up and organised.

This is highlighted by Jang's comments on how she was surprised by the speed in making adaptations in the Starbucks café – she thought of it as a 'systematic capacity' – as it swiftly applied different kinds of spatial arrangements depending on the different levels of risk management during the pandemic. It was capacitated by digital technology to mobilise different modes of accessibilities and circulations.

> Literally speaking, the adaptions were very fast. Depending on the risk levels, 1.5 or 2, really […]

It was not only the smartphones and the networks that became available as digital resources for the EER. As Park's anecdote on his gym and covid-19 test illustrated, his gym had always requested its members to type in their mobile phone numbers to gain access, and this set of data were acquired and reorganised by the government to send him the text message urging him to get a covid-19 test when a virus broke out in a Pilates class next door. He was tracked not through the EER, but through his gym membership.

Reshercher	Then did you stamp the QR code when you went to the gym? Is that how your movements were tracked?
Park	The gym, […] it doesn't do the QR codes, but we type in the mobile phone numbers. The membership records then come up [on the screen], like how many days you have left.
Researcher	Oh, that's how it works. Then it has always recorded your entries.
Park	Correct, correct.
Researcher	And they have made use of it, leveraged [the system to report] to the goverenment,
Park	Right, the government must have seen it. After they reviewed the records, I got a 'ding', a text messge [for a covid-19 test].

Ahn's university dormitory also had always requested the students' fingerprints for allowing access to the building, which in effect replaced the EER in that building. In fact, according to Ahn, it was better than the EER because it had the double functions of prohibiting outsiders' access and identifying who came inside.

Ahn	We have this system of fingerprints for going inside the building, and control visitors' access. That record is always there, while preventing access from outsiders, so wouldn't it be convenient for tracking and tracing? […]
Researcher	Oh……so that place has already had a system for security using biometric data.
Ahn	Yes, yes. Last term, I lived on the first floor and there was a new case on the second floor. So we all blocked the entrance door, the quarantine team came over and disinfected the whole second floor. Everyone in the second floor went to get tested.

The already functioning digital system worked more precisely than the EER because it could more accurately identify the locations of the individuals; as results, those living on the first floor were not asked to get tested and the first floor did not have the disinfectants sprayed over. These two incidents on digitally equipped buildings imply the possibly immense leveraging effects of digital technology and digital data in producing urban space. There are ultimately limitless number of ways that existing digital data and infrastructures of various scales and

scopes can be re-used and re-purposed. As an infrastructure, the materiality of the digital presents unprecedented capacities for creating new linkages.

As Larkin (2013) points out that infrastructures "reveal forms of political rationality" (Larkin, 2013: 328), the digital infrastructure created during this pandemic exposed the mechanisms of control in this era. Making use of the interoperability and interconnectedness of digital technology, there is practically no limit in the scope and scale of creating something like the EER. It is a new kind of spatial power, or "spatial software" (Easterling, 2014: 2) that weaves together who *can* be interwoven. This "platformising and infrastructuralising process" (Mackenzie, 2019: 1994) also could contingently leave out those who, unlike Jang and Park, cannot or would not produce digital data to leverage their urban living on the selective re-bundling of the networks.

Chapter 5.

Data-Producing Mobile Bodies

This chapter discusses mobile bodies as the site of data production.[107] It first calls attention to *mobile phone numbers* as the increasingly important identification indicating mobile bodies, often required for validating oneself and gaining access to urban facilities in the city of Seoul (5.1) Then the materialities the QR code and digital data in general, as perceived by the research participants are discussed (5.2) Lastly, it reveals how different posthuman bodies emerged through the process of becoming agencies in the assemblage of the EER. (5.3)

5.1. Mobile Phone Numbers as Identification of Mobile Bodies

This section discusses the findings mostly from the walking interviews that were conducted to contextualise the experience of the EER within the participants' everyday urban life. Questions included how the participants perceived the smartphones, their relationships with the device in everyday life, and the level of prosthetic-ness between the device and the body. This part of the field research was important for revealing the significance of the mobile posthumans (i.e. bodies tagged with mobile phone numbers) as the foundations upon which digital infrastructure could be built, when "[…] a city's population […] indeed own more mobile phones than cars." (Barns, 2020: 76)

The study investigated how the smartphones were embedded in the participants' everyday life in the city of Seoul, so as to position the EER within the contexts of these relationships.

> "The smartphone is necessary for *everything* you need to access in the city. (Lee, 25, kindergarten teacher, original emphasis)

107 The proposition of 'data-producing mobile bodies' in this study is necessarily bounded to the posthuman agencies who emerge through the processes of digital mediations for the dispositif. It is an attempt to see the agents as 'concrete individuals in specific social contexts' as Bevir (1999) interprets Foucault. Distinguishing agents from autonomous subjects, Bevir explains: "[a]gents are creative beings; it is just that their creativity occurs in a given social context that influences it." (Bevir, 1999: 67) It should be noted that there must be other subjectivities that may be formed through these processes – such as the citizens, the customers, or even the patients – yet this thesis focuses on them as data producers for the purpose of the study, and relays investigations of other emerging subjectivities to future studies.

When asked how essential it was to use a smartphone for leading everyday life in the city of Seoul, all the 11 participants answered that they felt it was unavoidable to have a smartphone, not only to attain competitive edge or quality living, but principally to reach for the "basic rights to service" (Yun, 40) in the city. As the capital city of a country with the highest proportion (95%) of adult population owning a smartphone in the world (Chapter 1), the city of Seoul as a research field meaningfully implied a status of living where the absence of the digital device was no longer quite imaginable; when asked this question, most participants spent quite some time to think about it and reminded the researcher, "but my smartphone has my *everything* in it." (Kang, 60)

Many urban services and facilities in the city of Seoul, public or private, increasingly required its citizens to identify and validate themselves through the mobile phone numbers before accessing them. "These services require you to validate yourself through the smartphone", witnessed Seo, a 24-year-old university student, who said that he once experienced unexpected level of inconvenience in going about the city for a week when he had lost his smartphone; he "could not do anything." Choi a 65-year-old housewife also observed,

> Mobile phone numbers have become the most important social identification.

Choi, although she often encountered difficulties in using her smartphone, still attested that she found her mobile phone numbers as the most important social identification, increasingly more so because she was asked to present her mobile phone numbers far more often these days than the 'resident registration number'. Park, a 37-year-old employee at a pharmaceutical company, articulated that his urban life was all "functionalised" in his smartphone. For him in particular, the right to move in the city largely depended on the updated information on its navigation app. Similarly, Jang, a 32-year-old designer said that her smart devices (she used both a smartphone and a smart watch) became "must" in urban living; "It has become unimaginable to live without them in the city." Indeed, as daily experienced by Im, a 27-year-old part-timer at a distribution centre, it was through the smartphone the gig workers like himself, were confirmed of a place of work every day. One had to be constantly watchful of the messages on the smartphone in order to quickly apply for a job, see any changes in the time slot, and respond quickly for confirming it. He would lose competitive edge in earning a living without being constantly connected to his smartphone.

Im also observed that smartphones were crucial because more than ever, the urban services were "formulised" through the 'mobile apps'. For example, making a reservation for the public share bicycle 'Ttareungyi' was done through the mobile app called ''Ttareungyi'. The presumed user interaction was very 'mobile' in nature: one needed to reserve a bicycle just a few minutes before riding it; otherwise your reservation gets cancelled. In other words, you need to reserve and watch time while on the move in order to make yourself on time and get on the bicycle. The pace and rhythm implicit in the system is that you make yourself available at the right time and place by being a mobile body that walks with certain pace to be on time. This was why Kang, a-60-year-old retiree, frequently asked her daughter to "sort out" the app in her smartphone now and then, so that her QR code[108] in the app 'Ttareungyi' was properly reset and refreshed for using the bicycle. Not only the bicycle but also all the share scooters, public or private, required you to reserve one on their mobile apps, Im reminded the researcher. Im said that to attain the "advantages cities offer" – meaning the resourcefulness of the cities – required their citizens to be well networked and be fluently mobile. (Rose et al., 2020) Im portrayed an ideal imagery of that mobile urban body as "strolling in a public art museum and fluently capturing the QR code put up alongside an artwork to be informed."

While Barns (2020) notes that a number of recent studies has found that the average person spends between three and four hours a day on their phone (Barns, 2020: 157), this study revealed that the presence of the smartphone was in fact much stronger than a few hours a day: Yun (40) found smartphone "unavoidably close" to himself, and he was even "addicted" to it; Park (37) looked for his smartphone "first thing in the morning without his glasses on"; Ahn (23) was with the smartphone "most of the time awake"; Jang (32) called her smartphone her "brain"; Choi (65) found using her smartphone often difficult but still called it her "other self"; Kang (60) always had her smartphone "by her side"; Kim (66) had her smartphone 'on' like a radio "apart from some five hours" a day; Seo (24) expressed his being with the smartphone as "always attached"; Im (27) felt anxious when he was away from it since it "does everything" for him; Lee (33) "cannot do" without her smartphone; Han (25) said her smartphone was "100% attached" to her body. The participants in this study, including the *yet to be networked*, mentioned that their smartphones were always "with" them although they may not be actively using them. Such 'intimate entanglements' (Barns, 2020) showed that the intensities of these

108 QR code system has been lately introduced for this share bicycle service to replace the LCD interface. QR code is becoming increasingly used in the urban facilities in the city of Seoul.

relationships between the bodies and the digital device became the foundation upon the urban assemblage of the EER was constructed.

While the body is still the critical place upon which power is exercised to reproduce itself (Foucault, 2020), for exercise of power in contemporary societies, the body itself is not the focus of attention, but the 'dividual' of the body. At the centre of the knowledge production are the 'dividual' elements of the bodies captured and reproduced through the information technologies. The individual is substituted by "the code of a *dividual* material to be controlled [...]"(Deleuze, 1992: 7, original emphasis) The production of 'dividual' elements that mark the bodies was very much valid for capturing the production of the QR codes for the EER. The QR codes (containing mobile phone numbers and the time of entry) became the most critical 'dividual' that indicated mobile bodies.[109] The basic technical mechanism of the EER is that the mobile phone numbers are used to reproduce the mobile phone numbers. (Figure 27) The microphysics of power gets enacted through the surfaces between the body-tool (Foucault, 2020) to reproduce the 'dividual' (Deleuze, 1992), that is the QR code containing a hyperlink that indicates the location of the mobile phone numbers and the data on time of entry. Through the performance of generating the QR codes, the dividual material of the body is instantly produced (by the very body).

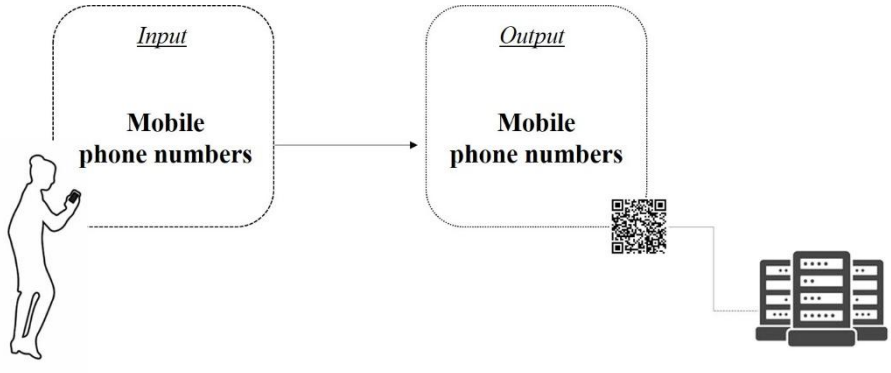

Figure 27. Basic mechanism of the EER: reproducing the mobile phone numbers. The mobile phone numbers are used to validate oneself, after which a QR code (that indicates a location where the mobile phone number are stored in commercial server) is reproduced.

109 As also discussed in Chapter 4, the EER collects only the mobile phone numbers and the time of entry to identify the mobile bodies. When the handwritten registers were used for tracking and tracing purposes in the early days, the government had also collected the residential address. Im (27) recalled that even then, while he omitted the details of his residential address on the handwritten register, he used to leave his mobile phone numbers as true because he wanted to be contacted in case the virus broke out. The later invented '080 Rest-Assured-phone call' system also automatically records mobile phone numbers and the time the phone call was made. As a society, it had been established for the past 14 months (as in August 2021) since the introduction of the EER that the essential data for understanding the movements of the mobile bodies were their mobile phone numbers and the time of entry.

For explaining the meanings of 'dividual' in urban space in his article 'Postscript on the societies of control' (Deleuze, 1992), Deleuze exemplifies Guattari's discussion of the 'electronic cards' that one can carry around to have a given barrier raised anywhere in the city. This spatial mechanism, according to Delueze, is about "giving position of any element within an open environment at any given instant." (Deleuze, 1992: 7) Deleuze highlights that such codes modulate, or "continuously change from one moment to the other" (Deleuze, 1992: 4) to allow or reject access. The QR codes that appear on the screens of the smartphones for the EER, indeed do modulate – it refreshes every 15 seconds for security reasons – to become the temporarily activated 'electronic cards' one needs to gain access across the cities during the pandemic. The modulatory character of this digital code is not only confined to the fact that it refreshes every 15 seconds. The possibilities of endless ways of creating further modulations – the kinds of digital formats or the kinds of data contained in the code, for example – paves the multitude ways for making "a sieve whose mesh will transmute from point to point" (Deleuze, 1992: 4) to allow or reject access across the urban space.[110]

5.2. Relationship with Digital Data

This section discusses the research participants' relationships with the digital data that they produce. Although all 11 participants affirmed that they preferred the QR code to handwritten information as a format of data, the materialities of the QR code – the illegibility of the patterns and the invisibility of their routes – were the cause of many doubts and uncertainties. Some of the participants creatively made use of the interoperable materialities of the digital data, in order to bypass the use of the EER.

QR code as 'enhancement technology'

All the 11 participants remarked that the digital data produced through the EER were far more competent as data in terms of speed, accuracy and security, than the analogue ones left in the

[110] On top of the initial dataset denoted in the QR codes for the EER, the South Korean government has recently added the vaccination records of the citizens to the QR code to further differentiate the mobile bodies (starting from 10 January 2022). Only people who have been vaccinated twice (and have completed the second jab 14 days before) have access to the restaurants, cafés, supermarkets, and department stores (as on 13 January 2022). This continuous change in tempering with the combinations of digital data along the course of the pandemic illustrates a good example of 'modulation' Deleuze (1992) refers to.

handwritten registers (regardless of whether or not they liked the EER as a system). When they talked about their perceptions about the QR code, they almost always made a comparison with

Figure 28. Kim, 66, and the researcher originally had agreed to go to a hospital for observing her performance for the EER, only to find that it unusually employed only the method of handwritten register (we later agreed to do the EER at the café where we were to do the sit-in interview). Because people had different speeds to "write and look up the watch" (Lee, 33) the inflow and outflow of their movements created quite a chaos.

the handwritten data. First of all, the QR code was faster to produce. Seo shared an experience of having had to slowly fill out the handwritten register one by one when he visited a restaurant with a group of friends. It was "tiresome" according to him, to write one after another. Lee also described the bodily movements involved in handwriting as "cumbersome […] you have to 'write' and look up the watch."

Secondly, the QR code was perceived more accurate. Kang, 60, pointed out that "the QR cannot lie." Han, 25, comparing the EER with the handwritten register (that lets you in spite of incomplete or incorrect data) said that it required you full and accurate data in order to pass. Lee, 33, used the word "clearer" many times throughout the interview to describe the EER. Her trust in the QR code as a form of data lied in her perception that data produced by a person who was physically and legally "attached" to the smartphone should be credible.

> Because, um……handwriting, as it was the case for me too (laughs)[111], people can have their own reasons to leave incorrect information. In that sense, you cannot be assured of

111 Lee had earlier shared her experience of making use of the flexibility of the handwritten register. She said that even though the place she visited once also had the EER, she instead chose to write on the handwritten register. It was a place she visited straight after she had a covid-19 test. She wrote down her younger sibling's phone number (who lived with her), in order not to cause trouble (of self-isolation, perhaps) to others in the place she visited (just in case she was infected). If her brother or sister got a call that he or she was infected, she would know straight away that it was her who got infected without 'disturbing' those in the place she visited.

> its accuracy and credibility. You could probably say that about the QR code too, but I think it has almost 99% accuracy. Or probably 98%? Under the assumption that the smartphone is legally owned by the person, the clarity is there. So this difference, yes, their credibility is definitely differentiated."

According to Lee, as long as the person who produced the QR codes on the smartphone legally 'owned' the device, the transparency in the process of data production was secured. This meant that the materiality of its prosthetic-ness became the foundation upon which the accuracy of QR code as a form of data could be assured.

Thirdly, the QR code was perceived more secure. The materiality of the 'mutability' was accounted as one critical quality the QR code embodied for its security. According to Ahn, 23, the fact that the QR code was 'refreshed' every 15 seconds meant an efficacy to be secure. It was safer because it could be renewed and flexibly limit the levels of information it could hold. Therefore it was "less critical", compared to fingerprints for example, said Ahn. In the following quote, he was answering to the researcher's question if the digital data could be differentiated depending on how they were formatted.

> I think, for purposes like the EER, data should be mutable […] I think the QR codes are less critical compared to something like the fingerprints, because it can change its form every time it is generated and can limit amount of data.

This ephemeral quality of the QR code was considered as its major strength that assured secure data transfer. Im also considered that the very fact the QR code was refreshed every 15 seconds meant that his identity was being constantly reformatted.

> (Regenerating the QR code on his smartphone) As you can see, as time changes here……every 15 seconds, one-time password is given out. It's like myself being constantly reformatted.

On another dimension, the 'regenerative' quality of the QR code was also considered as its strength. Jang raised this issue when she was comparing this quality of the QR code to the possible bodily failures when one engages with fingerprints for validations. She had friends who had long been trained as artists and whose fingerprints were erased during the process of

scrubbing the pastels with their fingertips. They could not make the official 'resident registration card' (which required signing with fingerprints).

Jang	You work for a few months like that, you have no fingerprints. They couldn't make the resident registration card.
Researcher	Oh, really? So actually they couldn't,
Jang	They couldn't register. So……oh, isn't that rather common? […]
Researcher	So you feel that it [the QR code] is more stable than something that engages your own body, (pointing at the finger) you think that the fingerprints can more easily change […] so you feel that the bodies are, that they actually can have a higher level of uncertainty.
Jang	Yes, yes, yes. […] also the fingerprints are absolutely more insecure. Because it is about your *body*. […] as the key you have for your body is just *one-key* […] because the biometric recognition is far more accurate, it is *more* risky (original emphasis).

Jang also pointed out that you could always have an injury on your fingers too; the human bodies were more variable and mutable than the QR codes and thus could easily fail to be translated into digital data. Human body was incomplete and always changed, according to Jang, which was not good enough for recognition of social identity. If the fingerprints did not work for some reason, there was no replacement for that, and this increased uncertainty. In contrast, the QR codes could be reissued by using different methods – different devices, or different apps – it had a room for improvement as 'enhancement technology' (Hogle, L. F., 2005) It compensated the weaknesses of the body with their constant 'refreshments'.

"I've left enough of networks"

Some skipped the EER because they felt that they were already well networked and had left enough information behind for the government to do their tracking. Seo, 24, showed trust in the EER and digital technology in general, but skipped registrations at the study café he frequented (but no other places). This was because he thought that he was *already* networked to the place through its mobile app – called 'Study Moa' – for reservation. It was even more accurate, according to him, than the EER because one needed to specify the precise 'seat' one

was to take during the designated time slot. He thought that if virus ever broke out, information he presented in the app should be used for contacting him. Our conversation went:

Seo	There are people who leave information and those who don't.
Researcher	Are you not worried at all about it when using the space?
Seo	But um……the study café as a kind of place, has an app for reservation.
Researcher	Oh, what kind of app is it?
Seo	(Pointing at an app icon on his smartphone) this is……it is an app called 'Study Moa'. This is for the whole branches [of study cafés], so I think since it is a way of reserving, if there emerges a need for investigation, this [record] should be linked to them [government]……as I thought it should work like that……
Researcher	I see, so you are not worried because it [the study café] is already networked this way?
Seo	Yes, records are already there.
Researcher	When you reserve, do you reserve a seat?
Seo	Yes, the reservation is about the seats.
Researcher	Reserving with a seat plan?
Seo	Yes, correct.
Researcher	Oh, then your exact whereabouts is all registered.
Seo	Yes, it is registered.
Researcher	Then it could be said that it is actually even more accurate than the EER (laughs).
Seo	That's what I mean (laughs).

Similarly, Han, 25, said that she usually did not write her information correctly in the handwritten register (when available) or skipped the EER (when possible) because she was

already networked to other systems such as the credit card company for payments and her circle of friends who accompanied her. She felt these were 'enough of networks' for the government to track her movements and give her a call if the virus ever broke out. In her words:

> Wouldn't it find me through my credit card payment records……if not, at least one of my friends must have written it correctly and if she gets a text [for a covid-19 test], I'll be like, "oki doki, I will be coming along."[112]

On the other hand, some others negotiated and controlled the scope of their data exchange by discerning relative significance of different data. Im, 27, said that for the handwritten registers in the early days he used to omit details of his residential address but he made sure to leave his mobile phone numbers correctly. This was because he believed that the mobile phone numbers as data were the most critical ones for him to be contacted in case there was an outbreak.

Im	I kind of felt like faking my mobile phone numbers too, but I didn't in the end.
Researcher	Why didn't you?
Im	Cos I know their importance.
Research	Oh……because the mobile phone numbers are important?
Im	Yes, when there is an outbreak.
Researcher	Because you could get a call?
Im	Yeah, in case the virus breaks out, because of that so…….I wrote them down as true. I have never faked my mobile phone numbers.
Researcher	I see.
Im	But address was little bit too much for me. You can just call the person to say that his traces overlapped with the infected……I thought, why would you need an address for that.

112 Covid-19 test is free of charge for anyone who wishes to get tested (no need for official notification) in South Korea (as in September 2021).

When they talked about 'leaving data' it always entailed who the recipient was: the government. As illustrated, these participants were negotiating their exchange of digital data with the government based on how well they were networked in everyday life. They were aware of the interoperable quality of digital data; if one had left 'enough data' at a place by paying with a credit card, for example, it meant enough 'quantity' of data was secured for them to be fed back with information in case of emergency. The level of their expectations on digital 'interoperability' was perhaps much higher than reality (i.e. the government may not be as diligent to make use of all the possible digital traces citizens left for their tracking and tracing efforts). Nonetheless, these accounts revealed how the citizens of Seoul as data producers were negotiating the level of data exchange, not only as their obligations but also as rights to have information feedback.

Alienation

The research participants revealed that they felt distanced from the data they produced for the EER because they could not comprehend how the data were processed and used. The lack of transparency over the process of data collection, calculation and distribution alienated the very producers of the data.

Digital data were perceived differently depending on the level of visibility, transparency and consistency. Digital data the participants willingly produced for themselves (e.g. health data through the smart watch) and the data that they produced for the use of the EER were clearly differentiated. Han, 25, quite starkly expressed this contrast. The sense of attachment she felt towards the data produced through her Garmin watch was completely different from her sense of detachment she felt from the data she produced for the EER.[113] Han made this comparison as below:

> I'm very much affected by it [the Garmin watch] as in every morning I look at the heart rate, the resting heart rate. It gets very high after heavy drinking […] if I train very hard, and if my body digests well, then it goes down gradually again. […] This is very much attached to myself, so, this, as it is pasted on me, I trust it […]

113 Garmin measured and recorded her heart rate and constantly reflected her health conditions, which in turn guided and changed her behaviours. For her, it was clear and transparent in terms of how the data were produced, what the data did and how they came to be used.

I really don't know how it [the QR code] is sorted out. If I come [to a place where virus broke out] after 6 hours, how do they re-categorise the space [in terms of time]? I don't quite get it, there is too much uncertainty around the standards.

Figure 29. Han, 25, came to the field research with two smart watches on her wrist as she wanted go for a run afterwards (Garmin watch is the black and works better for running. The Apple watch is the silver that she uses for everyday activities) She expressed her preference for the Garmin because its production of data was most precise and consistent.

Han was curious about how digital data could be meaningfully translated into physical 'proximity'. She also pointed out the mismatch between the geographical scope of the everyday life and that of the feedbacks (the so called 'disaster texts') the citizens always received. This mismatch made her feel further disconnected from the data.

Han	My friends always go, "Hey, an outbreak in Gangbuk borough [where she lives]." [I go] "How do you know?" She [or he] lives in Seodaemun borough, but gets messages about Gangbuk borough too.
Researcher	Tell me about it. I sometimes get messages about the city of Ilsan (laughs).
Han	Yes (laughs). This, I don't get how this comes to me. My mother lives in the city of Uijeongbu, and she says, "I got messages about Seongbuk borough." […] This, I don't get it, how, what kind of mechanism this is.

The lack of clarity on how the data worked, caused a sense of anxiety too. Kim, 65, said that she skipped the EER whenever she could help it, because she was worried (as she heard from others) that all her data might be "transported to China to be misused." Indeed, such invisibility made it difficult for these urban dwellers to even 'perceive' them. Park, 37, remarked that he couldn't quite feel what the QR codes did.

Researcher	Do you think that we are making a good use of the QR codes?

Park I don't see.

Researcher Oh, you don't see……

Park No, I can't feel it.

There was also a sense of 'powerlessness' expressed about the production and utilisation of the data. For example, Han did not believe her data would be protected anyway, and said that she had given up long before about the data protection. She even said it was okay that they took away her data and she would rather give up on them.

> I would rather think of them as flowing away (laughs).

Kang, 60, also imagined that her data were exposed and transferred "here and there."[114] She said,

> I do feel that the data move. […] when I register [for an online stock programme], at 9:30 in the morning I get calls from here and there. I set the spam filters [on the smartphone] but still they come. So many of them. […] They [the data] all fly away anyway.

Park's instant response on this matter was that he had always presumed that his data were already exposed out there and there was nothing he could do about it.

Park Wouldn't they already have them [data] all anyway? I think the database must be all out there, no?

Researcher Some people say they have kind of given up on all that data protection stuff by now,

Park Yeah, of course. You can't help it. It's even more felt that way now, since we have this QR code stuff.

What was interesting was that none of the participants said that they had given a thought about exactly where the data would go after the QR code scan. When questioned, 'where do you imagine or think it goes after the scan?' none of the participants said they had ever been curious

114 This perception came from her experience that whenever she registered some information online she constantly got spam calls.

about exactly where the data they produced went. Even Im, who explicitly said that he felt uncomfortable about the fact that the data on his movements were recorded and exposed, had not gone out of the way to find out about its exact routes after the scan. Im speculated,

> Wouldn't it be a server of a cooperation? But actually, I hope that it stays in a server owned by the government, while the cooperation just delivers the data that soon get volatised. But would they have done that? No……I don't think they would have done it that way.

This sense of alienation expressed by the participants was fostered by the fact that the QR code was illegible with its "weird patterns." (Choi, 65) While some (Ahn and Jang) said that its very illegibility made it more secure because it was also illegible to other people, it also meant incomprehensiveness. As Park said in the following conversation,

Researcher	What do you think is most interesting about the QR code?
Park	Um……that how much information may be in it.
Researcher	Oh, so you are curious about which information and how much of it is in that QR code.
Park	Right, right. That is the most curious part.

Kim, 66, expressed her amazement at the fact something looking like that (referring to the QR code pattern) could contain so much of her information. She thought the QR code extracted 'all' her credit data from her smartphone. That was why she preferred the '080 Rest-Assured-Call'[115] method because she thought the phone call method would dispatch less information. Kang, 60, thought that the QR code contained all her registered information in the government's archive, including the data on her "family relations and tax payments history, anything linked to the government." Although in fact, the time of entry and mobile phone numbers were the only two data collected through the EER, the imagery of the QR code with its mystic patterns, made the participants imagine that it contained much more than it actually did.

115 '080 Rest-assured-call' is a phone call system invented by Gwangjin borough of Seoul, to aid the elderly people who find using the EER difficult. Making a phone call to a place with the designated number starting with 080, automatically has the time of the phone call and the phone numbers registered. More on this system is explained in Chapter 5.

Due to the fact that specific actions were required to produce the data, the EER tended to make the producers more conscious of their own productions than other everyday digital transactions. Lee, 33, remarked,

> To be honest, you know, the tracking and tracing were still possible without the EER, using the credit card records and whatnot, your movements could be all tracked anyway. But how do I say this, the EER has made this felt even more exposed.

Through the use of the EER, the realities of digital data production were made more explicit. This had also been one of the presumptive reasons for choosing this case, as it would make it easier for the researcher to ask people about their *perceptions* on their productions. Yet the study revealed that the participants remained still largely unaware of the processes that the digital data they produced went through. Politically speaking, the materialities of the illegibility and the invisibility intrinsic in the digital data are likely to affect how people become conscious of their productions. Not only did the participants express a sense of alienation but also a sense powerlessness about these processes. If digitally mediated cities, as most often envisioned as 'smart cities', are to be built on the values derived from the exchange of digital data, the political economy of these exchanges can be quite challenging to account for, when the data producers themselves easily become unaware of their own productions.

5.3. Differentiated Posthuman Bodies

This section discusses how the EER as an assemblage produced differently networked bodies. From the content analysis of news articles, they were initially identified in three groups as: the *already networked*, the *yet to be networked* and the *network escaping*.[116] In the news articles,

116 As Table 8 in Chapter 3 shows, the field research revealed that there was no particular 'escaping' kind of person per se in terms of occupation or age groups as it had been spelt out by the news media. During the field research, the participants openly talked about the experiences where they happened to skip the registrations (either handwritten or the EER). Most of the 11 participants had an experience of skipping either of them; at least no one was found to be particularly keen to 'escape' the networks than others. Their behaviours had clear situational reasons; for example, when they felt particularly insecure about the EER setting, or when they perceived that they were *already networked* to the place through other digital means (e.g. such as the digital fingerprints for entering a building) The *network escaping*, as sometimes vilified as certain kinds of people by the news media did not seem to exist in reality. However, this section will still account for all three groups as they were uncovered from the content analysis. This is because it is important to document that the 'structure of vilification' (Kim, Y., Chen, & Liang, 2021) that was expressed through this 'persona' became an important constituent in the construction of the urban assemblage. The *network escaping* was not a human agency per se, but rather a 'figuration' that represented the possibility of 'deviant' subjects which would impede the government's fight against the pandemic.

the networked bodies were normalised. The non-networked bodies were addressed as bodies that needed be networked one way or another. The *network escaping* were those whose mobilities entailed the danger of escaping the EER 'gaze' and creating problems of invisibilities in the urban space. Remarks on the need for normalising the bodies into measurable units of knowledge (Foucault, 2020) and for the digital technology to perennially connect different areas of control (Deleuze, 1992) dominated.

'Already networked'

Examples of prioritising the *already networked* bodies could be found in the descriptions of the two sub-systems that spun off as part of the EER: the voluntary adoptions of the EER in cinema franchises and the Zero Pay system.

The major South Korean cinema franchises (CGV, Lotte, Megabox) decided to have their online members exempt from using the EER. CGV, who pioneered this method (and other cinema enterprises followed the suit with exactly the same method) explained that customers who were already registered as online members and purchased the tickets online with debit or credit card prior coming to the box office, did not have to go through the EER. This was because it already had the personal details of these customers in their database, the reservation details such as the prospective time of entry, and the seat numbers which were allocated when reserving online. Visitors purchasing in the box office with debit or credit cards were also exempt from using the EER because their personal details were already stored in the database of the credit card company. However, for those visitors who bought tickets offline with cash must use the EER. In fact, the cinema explained that the system was introduced in order to "complement the omission of data on the cash-paying customers."[117]

The user interface of the EER set up in these cinemas was different and more complicated than the one designed by Naver and Kakao. It required much more efforts on the part of the visitor. The visitor needed to capture the QR code displayed in the box office using the camera app in the smartphone and to manually type in details such as name, date and time of entry, contact numbers, theatre number and seat number when validation page was prompted. Finally, the mobile screen and a photo ID needed to be handed to the staff member who would then cross check the information. While the visitors who were already online customers and had

117 Park (2020) 'CGV Adopts EER... "For Speedy Information when Infected are Found"'. YTN, 19 June 2020.

paid online were given the fast track, the non-networked visitors had to go through a process that was much slower and more complex. There was a differentiation happening depending on how well you were generally networked online. The more you were networked – whether to the cinema website or the database of a credit card company – the more you gained freedom of access. This example also illustrated that prioritizing a networked body engendered a significant citizen-customer blur. Connected as a customer became the means by which one could seamlessly access various urban venues. Indeed, in the news articles the 'citizens' were interchangeably called 'users' or 'customers' and vice versa, blurring the lines between these subjects.

Another subsystem that emerged as part of the EER was the Zero Pay. As briefly explained previously, Zero Pay is a QR code-based mobile payment app, serviced by the city of Seoul. For those 819,974 small businesses across the country (as on 29 March 2021) that had already registered as members of the system, the printout of the Zero Pay QR code could be also used for the EER. The venues which were already networked to the Zero Pay system did not have to worry about installing an extra screen for the EER. This in turn also became an opportunity for the city of Seoul to expand the Zero Pay system (which had not been very popular).[118]

These examples of the two subsystems that spun off from the EER demonstrated how digital technology by its nature of interoperability, provided multiple ways to reconnect the *already networked*. Customers who were already well connected to many online services and financial systems were given the fast tracks. The existing geographical nodes of small businesses networked through the mobile payment system, were leveraged for fighting the national disaster. The two government systems – a financial system to support small businesses and a tracking system for fighting pandemic – had started with entirely different administrative goals. Yet these unrelated systems with the same digital technology of the QR code, became interoperable and leveraged each other in an unexpected manner. This being *already networked* was of paramount importance in creating control, as asserted by Deleuze (1992). The well networked bodies became the sites at which mechanisms of control were created and augmented.

118 Hongchan Kim, the Head of Zero Pay marketing team was quoted: "the city will do its best to promote Zero Pay to be installed in all the high- and mid-risk venues across the country." Kim (2020) 'Zero Pay Becomes the EER', Money Today. 16 September 2020.

'Yet to be networked'

From the early phase of introducing the EER, the government had acknowledged that it could be difficult for the senior members of the society to use and perform for this digital system[119]. The prime minister noted in his official briefings that it was the elderly population that was hardest hit by this pandemic; yet he still went on to implement the system.[120] Throughout the course of developing the EER, there had been two proposals according to the government, which were supposed to compensate for the difficulties faced by the elderly people. They were not some alternative ways of protecting them from the pandemic, but to have them networked anyway.

When the commercial apps Kakao Talk and Pass confirmed to join the EER, adding these platforms was claimed to benefit the elderly people's use of the system. Official briefings by the government announced that "the government strives to further increase the number of companies participating in the QR development"[121] in order to make up for the difficulties elderly people encountered with the use of the EER. As noted earlier, Kakao Talk as a messenger app required the users to be always logged in, possibly making a step shorter than other apps. However Pass, the self-validation app serviced by mobile telecommunications companies, was not necessarily simpler than Naver, and even if it was the case, adding a few more apps that provided the QR code function could not be understood as solving the difficulties faced by people who found manipulating the mobile device in a timely manner itself difficult. The formula was to have them networked one way or another.

A sub-system invented by a borough office was illustrative. Gwangjin borough of Seoul invented a phone call service called the '080 Rest-assured-call'. The fifty-seven public facilities within the borough were given specific phone numbers starting with 080. Whenever a person visited one of these places she could make a phone call to have her time of entry and phone numbers automatically registered. For example, as soon as a person visited the Borough Office of Gwangjin, she could call 080-209-0003 with her mobile phone (it did not have to be a smartphone) to have her phone numbers instantly registered with the exact time of the phone

119 What should also be noted is that the government's acknowledgement of individuals that could find it difficult to use the EER system was limited to the elderly people. There could be other forms of bodies (e.g. blind people) that would find the EER difficult to use but none of these could be found in the data sample.

120 Lee (2020) 'PM Jeong "EER to Become Compulsory in High-Risk Venues from the 10th"', Asiakyungje, 5 June 2020.

121 Lee (2020) "[Breaking News] QR Code EER Collects 6,000 Entry Records during 6 days of Testing'. Hankookkyungje, 7 Jun 2020.

call. The need for the person to be normalised into a unit of digital data and to be connected instantly remained all powerful[122]. Once introduced by Gwangjin borough, this service was also adopted by other local governments and venues across the country. Those who could not be networked through the QR codes should then be networked through the phone call. This service provision showed that the government would rather have all the mobile bodies, networked or not, digitally normalised (Deleuze, 1992).

'Network escaping'

The content analysis showed that there were two groups of people or personas whose mobile bodies were perceived as possible danger to the government's efforts to fight against the pandemic: the young adults and the delivery persons. Both groups were considered to have high levels of mobility that made their bodies invisible under the EER 'gaze' and could not easily be normalised into digital codes. Particularly, they were similar in that their mobilities took place in the open and porous domains of the city streets – on the urban streets where the EER could not be usually installed. Their mobilities worked against the spatiality of 'smartness' where "[…] there is no person who exists outside of the database […]"(Crandall, 1999 quoted by Crang & Graham, 2007: 804). In other words, their mobilities could not properly be 'internalised'. Foucault's discussion of the need for *enclosure* as the necessary spatiality for the gaze to work, was useful in analysing this phenomenon.

By organizing 'ranks', discipline marks and indicates values in space. The eight types of 'high-risk' venues announced by the government were such 'partitioned' (Foucault, 2020) spaces around which urban circulations were halted. If one looked closely at the eight types of venues categorised as 'high-risk', they either involved alcoholic consumption (clubs, date bars, bistros, karaoke bars, and karaoke halls) or particular bodily movements (indoor gym, no alcohol dance hall, and indoor standing concert halls). Large proportion of these venues (apart from the indoor gym) operated from evening onwards and invited many young people, drunkenness and perhaps some disorder, indicating a certain kind of subject positioning taking place. These were the venues that allowed bodies to make movements in ways different from movements involved in everyday practices; they were more random, unpredictable, unrestrained, and somehow Dionysian.[123]

122 Here in this new system again, the mobile phone numbers and the time of entry were the two required data.

123 Yet there is no scientific evidence as to whether these bodily movements lead to 'higher' risks of spreading virus than the

Also when these ‘high-risk’ venues were mentioned in the news articles, they almost always accompanied particular visual images. They were usually depicted as dark and crammed. They were often located in the basement of buildings and their heavy metal doors were closed with a notice sheet saying: “temporarily closed under the government guidelines.” (Figure 30, left) Main body texts reminded the readers that these places were the epicentres of the early herd infections and the very reasons that started the EER. Photographs of a famous transgender club often suspected to have started the first herd infection in the Itaewon neighbourhood, were repetitively published and broadcasted by the news media (Figure 30, right)[124]

Figure 30. As a person infected with coronavirus visited a club in Shinchon area (which is famous as a ‘university neighbourhood’) the civil servants visits to quarantine the place (left); one of the clubs in the Itaewon area (famous for youth and LGBTQ culture) where the infamous herd infection took place in May 2020.

Figure 31. People enjoying the Halloween in the streets of Itaewon (left); the club scenes (middle); the street scene of the entertainment district, and the police officers going downstairs to inspect the use of the EER (right). The image in the middle top says ‘easing of social distancing’, ‘young adults crammed in the clubs’, ‘unrecognizable identifications’.

movements from other everyday activities such as talking to bank clerks, eating with friends at restaurants or receiving treatments in hospitals.

124 Image extract from Lee (2020) ‘[Breaking News] Government “EER Becomes Compulsory in Clubs and Date Bars in June”’ Hankook Ilbo. 24 May 2020 (Left); Park (2020) ‘Following Naver, EER Expands to KaTalk and Pass’ Chosunbiz,

The Halloween day marked the pinnacle in the news reports of these mobile and young bodies. All the news articles in the dataset published on 29 and 30 October 2020 (from two days before the Halloween day) mentioned the coming eventful day as the "major risk."[125] The news articles displayed images of young adults enjoying the night indoors and outdoors (Figure 31).[126] Often, these spaces were occupied by a large group of unspecified young individuals crammed together. The blurry bodily movements within the spaces as photographed, appeared incontrollable. The streets were very crowded (Figure 31, left); the invisibleness of the bodies was emphasised with the blurry visual effects showing the inside of a club and the zoomed-in image of a person wearing the costume mask (Figure 31, middle); the bright neon signs on the streets were contrasted with the two police officers running down the stairs to inspect the use of the EER in these 'high-risk' venues (Figure 31, right). These were places produced by specific groups of people whose bodies were portrayed as undetectable by the EER gaze. This invisibleness made these mobile bodies un-locatable and untraceable. The urban space during the pandemic, could not risk uncontrolled disappearance of individuals and their "dangerous coagulation." (Foucault, 2020: 143)

The mobility of delivery persons too, were perceived as potentially 'network escaping'[127]. On 13 July 2020, the city of Seoul decided to treat all the 53 distribution centres in the city "as if they were 'high-risk' facilities"[128] and impose the EER in all of them, after three delivery persons from three different distribution centres were found to be infected with coronavirus

19 June 2020 (Right)

125 Lee (2020) 'Refrain from Halloween Day and Autumn Outings...City of Seoul Inspects EER in Itaewon Venues', KBS. 30 October 2020

126 The photographs used in the news articles are from previous years. Image extracts from Oh (2020) 'Coming Halloween Day, City of Seoul Inspects EER In Itaewon Venues' Money Today, 29 October 2020 (left); Lee (2020) 'Refrain from Halloween Day and Autumn Outings...City of Seoul Inspects EER in Itaewon Venues', KBS. 30 October 2020.

127 In the field research, the participant Im, a 27-year-old part timer at a distribution centre, expressed his opinions on the 'structure of vilification'(Kim, Y., Chen, & Liang, 2021) He pointed out that intrinsic in the digital technology was 'unpredictability' that created 'hypermobile' people, against whom the government attempted to "strengthen its control", again, by using the digital technology. Im criticised how the South Korean government, which had encouraged the digital technology to take its toll and to create such work environment now "let people take out anger" at those who move across the urban space, determined by the very logic of the digital technology. Being 'hypermobile', for some, had become a critical resource for living. They had to be always "in a position not to miss anything, listening (being wired) and ready to switch immediately." (Jauréguiberry, 2000: 259) Their time plans and spatial engagements were transitory; it was important that you were responsive to sudden changes so that you could secure your job opportunities. The smartphone was a major means to do that for the gig workers. To control the movements of the mobile bodies in order to prevent the pandemic worked against this latest urban paradigm we were living through. Im said, "Blame is embedded in the EER."

128 Kim (2020) 'No more of Coupang Crisis…City of Seoul Imposes EER in All Distribution Centres', Kukmin Ilbo. 13 July 2020.

(but whose infections were unrelated to each other). The entire facilities were shut down and quarantined as shown in the photograph published in a news article (Figure 32)[129]. The person spraying the disinfectant liquid into the space wore protective garments showing not much of bare skin, implying that the atmosphere was too dangerous to expose one's skin without protection. At the background were the machines and equipment that came to a halt. No one was working inside and all was stopped.

Figure 32. Emergent quarantine takes place in one of the distribution centres in Songpa borough where one covid-19 case occurred.

Boyeon Hwang, the Chief of Seoul Transport was quoted: "[d]elivery persons by nature of their occupation, roam about the whole city and meet lots of people. Citizens of Seoul have been expressing concerns with the spread of the virus through these distribution centres."[130] However, having three unrelated cases of infection in three distribution centres could not be considered as an actual 'crisis'. Also it was questionable if a delivery person 'met' more people in a day compared to for example, a neighbourhood doctor, especially in times when they adopted the contact-free delivery methods. Yet the mobile bodies of these delivery persons were deemed as potential risks. The shape and scope of their movements across the city were similar to the young adults described above: they stayed outdoor on the urban streets a lot of

129 Ok (2020) 'Prevent the 2nd Coupang Crisis…City of Seoul Imposes EER in Distribution Centres', Hankyoreh Shinmun. 13 July 2020.

130 Kim (2020) 'No more of Coupang Crisis…City of Seoul Imposes EER in All Distribution Centres', Kukmin Ilbo. 13 July 2020.

the times and were difficult to be tracked down under the EER gaze. They, in a way, invalidated the spatiality of *enclosure* (Foucault, 2020) sought by the EER[131] during this pandemic.

The differently networked posthuman bodies uncovered from the content analysis indicated that there were different kinds of 'frictions' occurring in their becomings. The three kinds of bodies became docile (or capacitated) in different degrees. Not everyone fully incorporated the networks into their bodies (*yet to be networked)* and some of their mobilities deflected the prescribed urban spatiality (*network escaping)*. Even for those who were *already networked,* the levels and layers of the networks must differ among them. As anatomies of the urban assemblage, they were differently capacitated.

This chapter paid attention to the human actors as core components of the EER. The actors were equipped with the prosthesis of the smartphone, which were increasingly perceived as the 'dividual' that indicated their mobile bodies. Their relationship with the digital data on the other hand, was ambiguous. QR code as a form of data was preferred to handwritten ones *because* the credibility of the data could be ensured through the physical and legal prosthetic-ness of the smartphone. Nonetheless, a sense of alienation and powerlessness in their attitudes towards their own digital production was notable from almost all research participants. Finally, differences emerged in their becomings of the posthuman bodies in the process of constituting the urban assemblage of the EER, some aspects of which also had spatial implications, which will be further discussed in the next chapter.

131 It is not an enclosure in its literal sense, but it is the imagination of enclosure and to certain extent, its effects.

Chapter 6.

Digitally Mediated Urban Space

This chapter discusses spatial orders embedded in the EER and how they are experienced by the citizens of Seoul. They are more like spatial indicators, symptoms, or clues uncovered in the course of the analyses. It is by no means a full picture of all the possible urban changes or spatial transformations that could happen in digitally mediated urban space. Nonetheless the researcher presents them as useful clues for further studies in the field of digitally mediated urban space.

The following should be noted regarding the structure of this chapter. Precisely *because* the *potestas* (entrapment) and the *potentia* (empowerment) (Braidotti, 2017) were intricately intermingled in the process of assembling the EER, it was not all clear when one attempted to distinguish which actors in the assemblage contributed to exactly what, and which affects each exuded along the course of the *becomings*. Yet this thesis essentially agrees with Brenner, Madden & Wachsmuth (2011) who assert that for analytical clarification in studying an urban assemblage, "it is essential to explore who is doing the structuring to whom" (Brenner, Madden, & Wachsmuth, 2011: 236) (2.2). This chapter is therefore divided into two sections for discussing the spatialities of the QR codified urban space: spatial order or logic embedded in the EER as a spatial planning (6.1); and the spatial experiences that perennially shifted as the

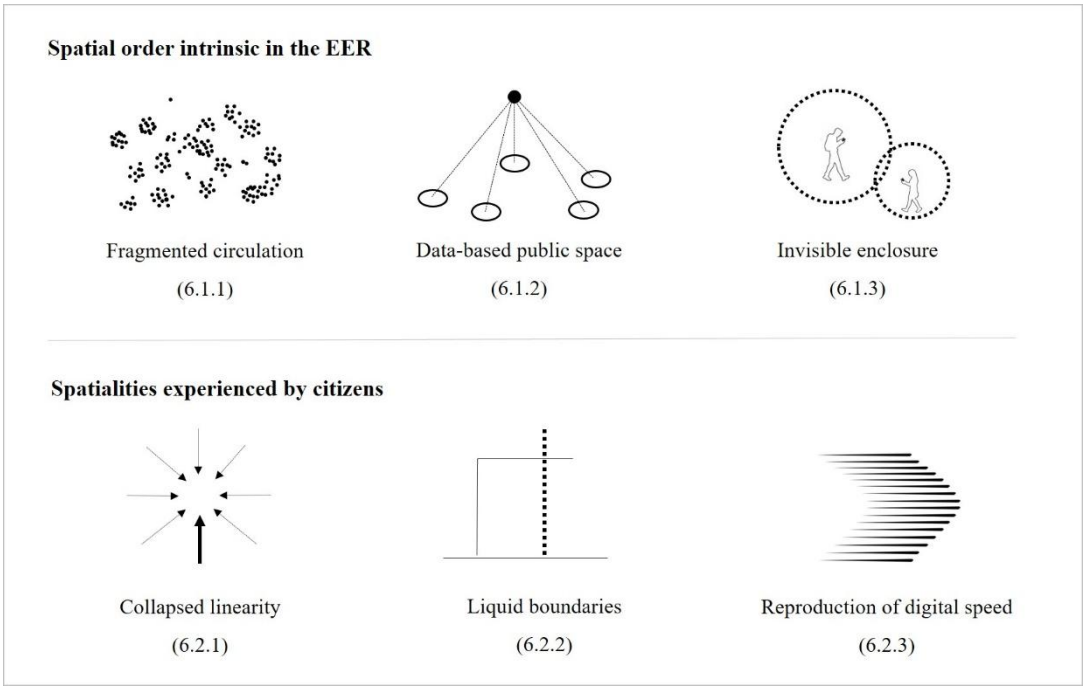

Figure 33. Spatial order embedded in the EER and how they are experienced by the citizens

EER was performed by the citizens (6.2). Figure 33 is not an attempt to formulate a spatial configuration, but is a way of visually expressing the spatial dynamics described in each point.

6.1. Spatial Order Embedded in the EER

The EER operated "at real time and at scale" (Barns, 2020: 188) that exceeded any place-bound urban infrastructures. Spatial order or logics embedded in the EER are: fragmented circulation (6.1.1); data-based public space (6.1.2); and invisible enclosure (6.1.3). As illustrated in Figure 33, the effects of the spatial order operated at multiple scales: across the cityscape, between public spaces, and on the mobile bodies.

6.1.1. Fragmented Circulation

This section discusses how spatial order intrinsic in the EER allowed the South Korean government a remarkably agile mode of spatial organisation. It allowed the government to manage multiple circulations across the city. The result was an urban fabric that constantly transformed with shifting constellations of connections.

Decisions on the scope of application were made and remade, sometimes changing within a span of few hours. EER was test run for 9 days (1 – 9 June 2020) in 19 venues across the country including clubs, karaoke halls, libraries and churches in the cities of Seoul, Incheon and Daejeon. Straight after the test run, the system was imposed on a different set of places, the so-called 'high-risk' venues across the nation. These initially included clubs, bistros, date bars, karaoke halls, karaoke bars, no alcohol dance clubs, indoor standing concert halls and indoor gyms. The modes of governance – whether the EER should be 'advised' or 'imposed'

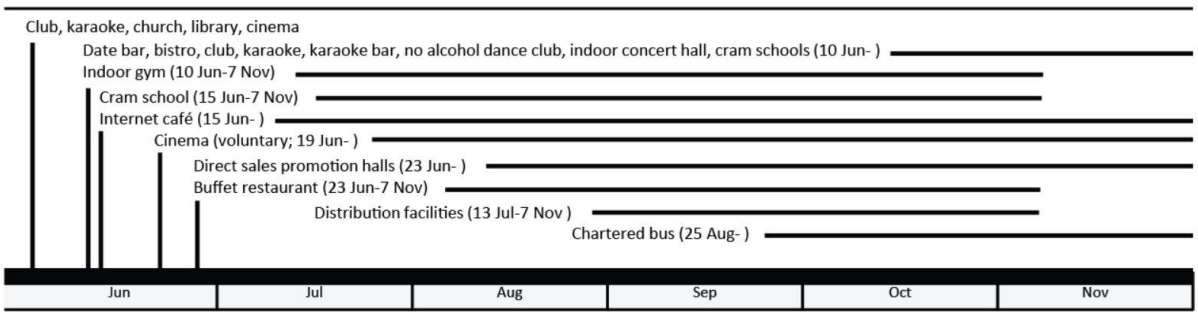

Figure 34. Urban circulations made and unmade throughout the course of pandemic using the EER. Extract from Figure 20.

– also swiftly changed depending on emerging situations of the pandemic. For example, up until the morning of 10 June 2020, tax incentive measures were being discussed for the 'cram schools' (private tuition schools) that would voluntarily adopt the EER system, but in the afternoon on the same day, a plan to make it compulsory was suddenly announced. Along with the cram schools, internet cafés were included to begin the use of EER from 15 June 2020. The following kinds of venues were consequently added, as there arose incidences where these types of businesses came to become the 'hot spots' of herd infection: direct sales promotion halls and buffet restaurants on 23 June 2020; distribution centres on 13 July 2020; and chartered buses on 25 August 2020. Yet from 7 November 2020 the indoor gyms, distribution centres, cram schools and buffet restaurants became no longer obliged to use the EER based on the restructuring of social distancing rules enacted on that day[132]. Instead, EER became compulsory in cafés and restaurants sized larger than 150m^2.

The spatiality of the EER itself is mobile, like the 'ships' (Hetherington, 1997) that easily shift its locations to be placed anywhere and anytime. This spatiality was also expressed as "fragmented" and "atomised" by one of the participants (Im, 27). The physical lightweight-ness of the system and the programmability of digital technology have synergized with the unpredictability of the pandemic, to grant the government shifting modes of governance. This also meant that the government did not have to build anything hardware for its spatial governance; it could relay many frivolous tasks to the users who were indeed extended as "essential human infrastructures." (Kim, Y., Chen, & Liang, 2021: 3) Once the government has created a population of docile bodies who were willing to, and capable of the producing the required digital data, the urban circulation could be easily manipulated and controlled.

Had the EER been an urban infrastructure that required, as conventionally, a lot of hardware resources and long-term time management, this kind of consistent 'plan switching' could not have happened. It was possible largely because the *mobile dispositif* relied on everyday technologies for its production (rather than building a grand infrastructure at one go). Being lightweight, they were powerful because once they were installed in the required venues across the city, they got activated straight away to become the means for collecting data on the movement of the population. It was indeed "both immense and minute." (Foucault, 2020: 223) The lightweight-ness of the EER became the critical asset behind its flexible applicability and expandability; it has in effect, enabled the South Korean government to consistently shift the

132 See Figure 20 (Chapter 4) for changes in regulatory decisions made on the applications of the EER.

geographical scopes of its application and manage multiple urban circulations throughout the course of the pandemic. What makes the EER different from conventional infrastructures that control urban circulation (e.g. roads, water pipes, rail ways), was that it had endless possibilities of re-combinations and reformulations in creating the circulations, real time.

6.1.2. Data-based Public Space

With the mechanism of relaying responsibilities of 'installing' the EER at the scale of business units, the EER had created a sense of responsibilities or commitments of risk management at the scale of such 'venues' across the urban space. The virtual time-space produced by the assemblage of the QR codes that indicated each body, was reproduced in the actual time-space of the urban landscape (Figure 35). This was also clearly perceived by the research participants. Ahn, 23, brought up the issue of sociality emerging in the process of co-constituting a "safer space" with the use of the EER. According to him, the space we visited together for the sit-in interview was constructed by people who had signed up a "social contract".

> It feels like that I have come into a safer space. Because these people all have checked in with their QR codes, if there is any outbreak, I will be contacted and protect myself a little better……this kind of safer space, it feels.

Ahn called where he was at, a "safer space". This was not only because he produced his own QR code but others in the space also did it. It was a space of *rank* (Foucault, 2020) which provided positions for individual bodies. They were 'different' from other random people (or

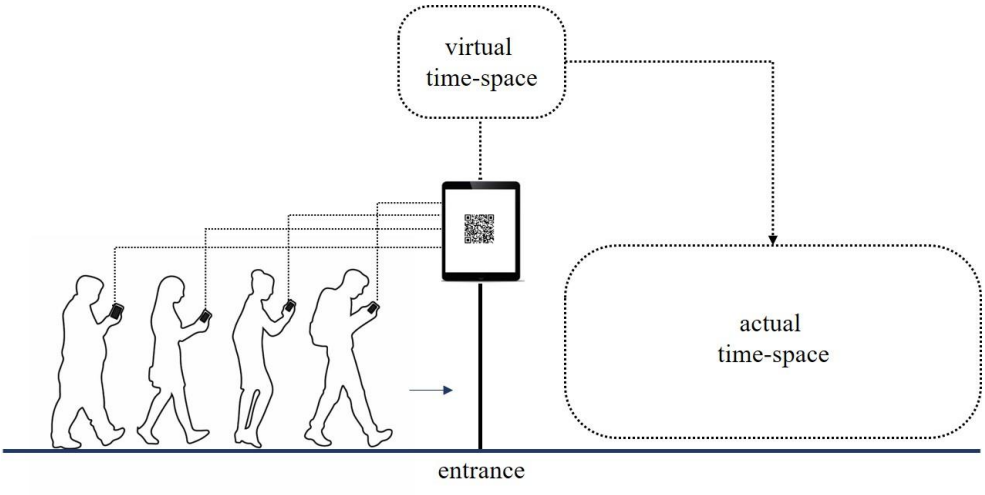

Figure 35. Virtual time-space assembled by the QR codified bodies are reproduced onto the actual time-space.

nomads) walking outside the café; the people together in the café were safer bodies because they entered the place after the QR codification; they were there together having promised to let others know in case the infection broke out. In other words, it was not only about the present moment but also about future security this public space[133] ensured. Public space as such 'safer space' emerged in the process of assembling the EER. This sociality of data-based security in turn, may have to certain extent encouraged these data-producing docile bodies to sustain their performances in creating such space.

The EER digitally materialised particular sociality onto the urban landscape. Such "inner circle" (Park, 37) was indeed, mostly in the form of the *rank* (Foucault, 2020) or segregation. Park similarly perceived the spatial organisation of the venue where we carried out our field research. An extract from our conversation is as following.

Researcher	If possible to imagine such a thing now, where do you feel the spatial boundaries were when you were using the EER?
Park	Inside where I stamped this, and the outside get completely separated.
Researcher	What do you think here inside is, and what do you think there outside is?
Park	Inside here is an inner circle……as stamped.
Researcher	An inner circle. What kind of circle is that? How,
Park	Those here, people who take possession of this space.
Researcher	Oh, people who *possess*, or who *can* possess this space, because they have stamped?
Park	Yes. (original emphasis)

Park perceived that the spaces were partitioned according to the differences in the bodies; who had codified and who had not. As the EER instantly enact and constantly update (as people come and go) the particular assemblage of the serendipitous gatherings (in the café), the physical space was accordingly "completely" partitioned from the outside. The people who had

133 In this thesis, the word 'public space' was used figuratively to denote a kind of an urban assemblage created by any group of mobile bodies at any point in space at any time in serendipitous manner. It does not go any further to discuss its political implications at this stage.

joined the network "possessed" the space, whereas those who had not, did not belong to the "inner circle."

Jang, also gave an example of a shopping mall overseas[134] that illustrated how the QR code was used for spatial segregation. People who had been vaccinated and belong to a particular assemblage (virtually created initially) can then physically mingle together.

> As I heard, in the overseas, it becomes a way of complete social division.....You can't even go in, you can't go inside a shopping mall *at all*. A family of four went [to a shopping mall] during a weekend and the mum and dad had been vaccinated because their workplaces required them. But the children, you know, were not and they couldn't go in (original emphasis).

The EER reproduced the virtual assemblage onto the actual urban landscape. The public space was ephemerally reorganised real time – depending on who came in and who went out – sustaining the creation of a virus-cautious space, if not a virus-controlled space. It created time-space laden with values; safer, securer, and protected. Its effects came from the knowledge produced by the mobile bodies themselves. It implied a kind of public space that emerged based on 'constant accumulation of data' that may create short, or long-term segregations within and across the urban landscape. Not to forget, that these time-spaces at the scales of these 'venues' became the functional scale of quarantine and isolations when the virus broke out.

6.1.3. Invisible Enclosure

Noting historicity of power, Deleuze (1992) questions if the spatiality of 'enclosure' (evident in prison, schools and hospitals as discussed by Foucault) is any longer so relevant in the era of digital technology and communications networks. However, this study revealed that the conception of enclosure was still relevant in understanding the experience of the EER; though it was produced and expressed differently from the spatialities witnessed in the "vast spaces of enclosure"(Deleuze, 1992: 3) in the nineteenth century. It was a way of interiorising or enclosing *through* the networks to encapsulate the mobile bodies. It was a way of 'densification' that made sure there was not an unconnected body, as Thrift (2014) quoted Peter Sloterdijk.

134 Three months after this interview, similar practices is increasingly adopted in South Korea (as in November 2021).

Digital technology and communications networks consistently created enclosures in different modulations.

This study had the advantage of examining eleven different sites across the city of Seoul, because the researcher followed with each participant's choice of venue for the field research. This allowed her to witness how the participants experienced the 'gazes' differently depending on the spatial organisations of the particular places and their previous experiences. The spatial characteristics of both *disciplinary space* and *space of control* existed with different emphasis on each, depending on the spatial organisations of the place.[135] The one-directionality of 'gaze' created by Panopticon was still perceived sometimes, but it was not the only kind. Participants perceived multi-layered combinations of 'gazes' as multiple panopticons were enacted through the digital technologies to enclose the mobile bodies at any time.

Yun's case revealed a gaze closest to what Foucault observed in the composition of the Panopticon. We visited a community centre run by a local government for his participation in the field research. There was an assistant sitting right behind the EER setting located next to the entrance door, giving instructions to the visitors. What was interesting was that Yun appeared to disregard the assistant's presence. He behaved as if she did not exist and he performed even faster than her verbal instructions. He outpaced her directions. He later revealed how he usually felt irritated by the presence of such 'assistants'.

> There is always a person sitting there [at the EER] in government facilities. Same in a borough office. They control it, but I hate being told what to do. I was to do it anyway, I was taking it [smartphone] out to do it but when you hear her saying 'do it' it really irritates me. […] Oh, and there is this thing too. [For instance,] I did the EER, I stamped, I was doing something inside, and then I could just come out for a phone call or for some reason to get something from my car, you know. I come out and then go inside again. You know then I don't have to do it [the EER] again? But then I have to explain it to the person [that I had already registered], then it becomes quite cumbersome. Or even if there is no one there, how I look, the look of me as someone who just goes inside [without going through the EER] somehow, I would look bad, like someone choosing not to do it, that I could be misunderstood……these thoughts come to me ……it sounds like nothing, but there are stuff like that too.

Yun's perception of the gaze came from the space. It was not only the gaze that came from the government official in charge, but also multiple gazes that possibly could come from any individuals who happened to be in the space (i.e. people who might misunderstand him for

135 Foucault (2020) himself points out that different shapes of power (e.g. sovereign, discipline, control) are never exclusive in strict sequential or historical order in reality but transiently co-exist at any time.

choosing not to use the EER). They were the actual gazes from others who would observe his movements. The imagined spatiality in his case was that of an enclosed space that had positioned gazes looking at him and making judgements about his actions.

The gaze was sometimes substituted by the automatic dispense of the sound, "you have been validated", that was announced when one scanned the QR code. In some of the venues used for the field research – in the cases of Ahn, Seo, Han, and Kim – the automatic sound that filled the places worked as an indirect gaze. While Kim, 66, was finding it difficult to have her QR code scanned, the staff member far away working behind the order counter shouted at us: "The sound should come out!" He was monitoring if the sound was being dispensed while he was not watching it (or could not see exactly what was going on the screens from that distance). Not only the staff member, but the whole room was listening to the sound in the café Ahn and I visited for his participation in the field research. An extract from the observation note on that site reads:

- There is no human interaction in the EER setting and it is largely self-regulative.
- In the café, most people are working on their laptops. It is very quiet, and people can clearly hear the electronic sound, "you have been validated" after the scan. There are many 'indirectly' gazing eyes. It is this sound through which the 'gaze' gets enacted.
- It is not the presence of a particular gaze *per se* but the spatial atmosphere – that everyone can hear the validation sound – that is affective. The very presence of others in the space who *can* hear the validation sound become the gaze itself.

Im's case was most telling in showing how gazes could be organised in multiple ways. After entering the building of distribution centre on the ground floor, we went downstairs and walked for some time to encounter a 'body temperature gate' (that looked like ones in an airport for body check). The machine was equipped with a 'gaze', a sensor for checking the body temperature. There was also a gate keeper sitting right beside the machine, who gave out a sticker that said you were '36.5°C on this Saturday' (the day we did our field research). She requested us to have it stuck on our bodies where it was "visible" all day long, as it would grant us to move in and out of the building without having to pass the 'body temperature gate' each time. The sticker on your body made it visible to others that your body was, to certain extent, a safe one.

Figure 36. After entering the building from the ground floor, one had to go downstairs and walk along an aisle for some time to encounter the 'body temperature gate'. After confirming your body temperature, you are given a sticker (far right: the researcher photographed her own arm with the sticker on it)

We then went through a door into one of the many warehouses in the basement floor. There were many workers who had already checked in with their QR codes. Im walked fast towards a staff member of his team for the day, to have his QR code scanned by the staff's smartphone; the smartphone held by the staff member moved along with him.[136] There were two interesting incidents regarding 'photographing' in this place that highlighted another dimension of gaze. When the researcher was walking along with Im towards the 'body temperature gate', the gatekeeper asked us to be photographed.

Staff I'm sorry but, because we need to take photographs to report, there aren't many people today……so if you could just stand there social distancing from each other, could I please take a photograph of you two from behind? I've been waiting for so long but there weren't people passing in groups of two or more (laughs), so if I could just take a photo of you guys from the back……

136 Entering a workplace implied to be in close proximity with the person holding the smartphone for scanning the QR code. Im explained that depending on who your subcontractor was, the EER was organised differently (some subcontractors had the screens put up on the floor near the entrance door, as shown in the bottom left photograph in Figure 37). Checking into the workplace depended on who employed you, rather than having physically entered the space, per se. There was an incident that highlighted this spatiality composed of relationships. When he approached the staff member for the EER, Im was told that he had to change into his work shoes before he could scan his QR code. So he went outside the warehouse and came back with his work shoes on. In effect, during all this time, he was not virtually inside the space because he had not scanned his QR code until he came back. The EER was constructed not so much according to the spatial structures of the building but according to the relationships.

Figure 37. Scale of one building in the distribution complex (top); Workers who had QR codified lined up when a staff requested them to stand with some distance in between so that he could take a photograph demonstrating a good social distancing and report to management (even though it was August, workers were wearing jumpers as it was a refrigerated warehouse) (middle); Some subcontractors had EER setting outside entrance door (bottom left), but Im's had one held by a staff, which layered upon Im's smartphone for QR codification (bottom right).

Researcher	Oh, well (laughs), I'll go behind.
Im	Should I stand here like this?
Staff	Yes, yes. If you look that way, and if you could stand there just now, one, two, three. Thank you.

Similar thing happened inside the warehouse. As the work was about to begin (and as the researcher was about to leave), a staff member asked all the workers to line up with some distance in between "just for a while" so that he could take a photograph demonstrating a good social distancing and report to the management. The middle photograph in Figure 37 shows how people were lined up waiting for the staff to take their photographs. The eyes that would gaze at the reported photographs were not located inside the warehouse. This one warehouse located in the distribution complex of a colossal scale had a multiple layers of gazes: (1) the gaze or the sensor of the 'body temperature gate' recognising and calculating you; (2) the gatekeeper who cross checks and gives you out the '36.5°C' stickers; (3) the sticker on your body gazed at by everyone else inside the building to allow you in as a 'safe body'; (4) the staff member who holds a smartphone to scan your QR code; (5) an imagined gaze that looks at the photographs of the workers standing certain distances from each other.

In contrast to the distribution centre, Starbucks café where Park participated his field research did not have any particular 'gazer' in the place. The staff members were standing behind the order counter and no one paid attention to the visitors' performances with the EER at any moment. It was expected that everyone self-regulated. Yet Park was the participant who expressed the strongest perception of surveillance from the EER. For Park, regardless of the presence of actual eyes looking at him, the whole ecosystem of tracing and tracking made him perceive the gaze. The gaze came from the very fact that he got text messages from the \government and the HR department of his workplace, day in and day out, alerting new infected cases. The gaze was written in the text messages that he received constantly.

Park	I constantly get text messages from the company I work for. Real time, you know……the Science Park in Magok area, [where my company is located] is huge. Then there, this department which tracks all this, dispatches text messages to every employee every single day, saying who got infected in which building. (Scrolling the screen of his smartphone to show the text messages he has received) like this […] Yesterday, it was the 5th floor of Building E14, I work on the 3rd floor of E14……

Researcher	(Looking at the screen) that's a lot of people getting infected……
Park	A lot. It comes up constantly……*constantly*, this and that, *real time*. Really, it's getting tiresome.
Researcher	That's how you feel so much watched over.
Park	Correct. (origial emphasis)

Figure 38. The café where Park's participation took place had a spatial arrangement that had no explicit 'gazer'(left); Park shows a string of text messages on infected cases he gets every day through the 'disaster alert' system (right).

As Park's experiences tell, the gaze did not have to come from a human body or a sensor embedded in, for example, the 'body temperature gate'. The gaze did not have to be physically 'located' somewhere, but could be constantly produced anywhere. Whereas the "vast spaces of enclosure"(Deleuze, 1992: 3) such as the prison and hospitals of the nineteenth and twentieth centuries, were organised to position the gaze at the right spot of its operation, the gaze of the EER indeed could be enacted anywhere, very easily so. This real-time production of gaze through faster and finer grained networks came to be perceived as the 'invisible enclosure' that surrounded Park himself.

> The relatively primitive forms of feedback offered by disciplinary panopticons have become vastly more sophisticated, dynamic, mobile, omnipresent, and operative […] (Williams, 2015: 217) .

Tracking and tracing system with its communications networks enclosed individuals where they were. The new technologies have transformed the ways of 'enclosing', through the effects

produced by interlinked ‘networks of gaze’. The capacity of ever-expanding networks created invisible contours of control; the citizens of Seoul during this pandemic were enclosed in every possible way so that there was “no person who exist[ed] outside of the database” (Crandall, 1999 quoted by Crang & Graham, 2007: 804).

6.2. Spatialities Experienced by Citizens

As the EER was assembled and reassembled throughout the course of the pandemic, it went on to change the ways of creating the linkages between the different actors and actants. Some frictions in the linkages were gradually removed and new inventive measures were introduced; spatial perceptions on ‘inside’ also somehow changed; the prosthetic-ness of the body to the smartphone improved. This in turn, produced shifts in spatial experiences. The three most obvious changes in spatial experiences shared by the research participants were: collapsed linearity (6.2.1); liquid boundaries (6.2.2); and reproduction of digital speed (6.1.3).

6.2.1. Collapsed Linearity

Talking with the participants about their experiences of using the EER for the past 14 months, it was revealed that the spatialities enacted by the EER shifted its strategic focus throughout the course of the pandemic. Space of enclosure in the sense of the nineteenth century, was produced fervently in the beginning of its introduction, but was gradually abandoned in large part, as the citizens of Seoul started to realise the material inconsistencies between the physical spaces (which mould) and the digital technologies (which modulate) that constitute the EER. Kim, 66, shared her observation that during the early days of the pandemic people tried to control the inflows and the outflows of the buildings by limiting the number of entrances or by using smaller entrances, in order to create better visibility of the mobile bodies. This was increasingly becoming less of the case.

> You know in the early days, [when] I went to Hansalim [supermarket], I had to go through the back door and have my temperature measured there……they blocked the front door, then. Now, it’s all wide open (laughs).

The space was then reorganised to make it easier to account for the flows of movements and to make them more 'visible'. This was a deliberate effort to create a space of enclosure where "separations should be clear and the openings well arranged." (Foucault, 2020: 202) Yet this, as Kim testified, was no longer so much the case. Intrinsic in the EER was a linear spatiality (i.e. having to scan one after the other in a queue), which often contradicted with the kinds of movements in urban venues where people moved in simultaneously.

Choi, 60, observed that the shopping mall she chose as the site for the field research, had recently adopted the '080 Rest-Assured-Call' method because of the difficulty of managing it when the traffic and volume of inflow became too big, especially during the weekend.[137] It was "faster to call", according to Choi, and the spatial linearity intrinsic in the EER was not suitable for ensuring speed of inflow. Ahn, 23, also shared what he observed during his trip to the city of Busan. He said in that city, every venue he visited employed the '080 Rest-Assured-Call' method. He thought that was because the speed of the queue moving forward was highly important particularly in that tourist city.

Ahn	Yes, it was all phone call there. More than nine out of ten.
Researcher	Why do you think that was the case? Why would you say that they use that [the phone call method] so much?
Ahn	In my opinion, Busan, as Busan has many tourists […] stamping the QR, if not recognised, then you have to stamp again, and so on, then you get a traffic jam……Just putting the numbers up on the wall, everyone can see it at once and do it at the same time, so the queue quickly moves forward […]

Having the phone numbers on the wall, the visitors could *simultaneously* perform. Han welcomed this invention and called it an "improvement". The '080 Rest-Assured-Call' came up throughout our conversation.

Researcher	The phone numbers, when you go out with your friends for a meal [as you mentioned]…… (the researcher finds a phone number placed at the corner of the table they were sitting at) Oh, here it is (laughs) (Figure 39, left)

137 Many big stores such as the department stores and shopping malls had not adopted the EER but just measured the visitors' body temperatures. But after the covid-19 herd infection at a branch of Hyundai Department store in July 2021, many big stores have started to adopt the EER and also the '080 Rest-Assured-Call'.

Han (Laughs) all places have it these days, it gets better.

Researcher So as it is written like this, then you and your friends can all do it together at the same time, can't you, instead of queuing.

Han Yes, yes. […] because for example, if there aren't many good seats remaining [in the restaurant] […] So we go in first as fast as we could, and then do it [the EER] as we take our seats […]

Figure 39. The '080 Rest-Assured-Call' numbers found at the corner of the table Han and the researcher were sitting at during the sit-in interview. As it says 'Gangbuk Rest-Assured-Call', the numbers were assigned to each venue by the local government of Gangbuk borough. All the tables in the café had the phone numbers on them (left); Reference to the size of phone numbers used in the club as described by Han. It is a photograph taken by the researcher at the basement carpark of the shopping mall, the field site for Choi, 65 (right)

Han also talked about the latest use of the phone numbers in the clubs.

Han Yes, we had the QR code stuff in the earlier days……the device was placed in the front, but I heard they changed recently, they have put up the phone number, in really big size, so that everyone could see it even from far behind in the queue.

Researcher Oh, then in the early days it was just the QR code at the entrance door……

Han Yes, at the entrance, as in a café. Or the bouncer would hold the smartphone and people would stamp, stamp, stamp, like you would do with a bar code (laughs).

Researcher (laughs) Then it would have been quite slow to go inside.

Han Really slow, yes, yes.

Researcher	But then the phone number could make it faster?
Han	Faster, yes. It is faster, and also everyone is given the same amount of time, if you could put it that way.
Research	Oh, that's right. Since you could see it [the phone numbers] from far behind. You could go in as a bundle.
Han	Yes.

The '080 Rest-Assured-Call' system, which was originally invented by Gwangjin borough of Seoul for assisting the elderly (5.3), was now widely used in many places as "improvements" (Han, 25). By making a phone call, one could automatically leave the mobile phone number and the time of entry in the system. It did not require another urban screen for a scan and had further shortened the number of interactions required for digital registration. It was not only faster but had solved the problem of linear spatiality. The linear spatiality of the EER was sequential, checking in individuals one after the other, and it had not quite worked well with the instantaneous materiality of the digital. The '080 Rest-Assured-Call' in contrast, effectually allowed everyone to produce digital data at the same time, further speeding up their production.

The '080 Rest-Assured-Call' method also further presented implications on the insignificance of physical enclosure. The phone numbers could be placed anywhere and the spatiality in the sense of the 'access bars' (as Guattrai is quoted in Deleuze, 1992) was weakened; the tables were already accessible before Han and her friends made their '080 Rest-Assured-Calls'. How the phone numbers were pasted on every table illustrated that the mode of *control* was indeed modulatory there. The '080 Rest-Assured-Call' numbers assigned to each venue by the local government was a new way of "giv[ing] position of any element within an open environment at any given instant." (Deleuze, 1992: 7)

6.2.2. Liquid Boundaries

The placement of the EER changed how spatial boundaries were perceived. The screen for the QR code scan worked as the wall of interaction beyond which you were allowed the access. Implicit in this intervention was an entrance or access point that could always be removed and

replaced at any time. This was why many participants mentioned that they felt the spatial boundaries were being "reorganised." (Im, 27)

Researcher	So then actually, it is only when you go inside there [the warehouse], not when you go into the building, but when you go inside it, that you stamp it [QR code]?
Im	Yes, that's how it is.
Researcher	I see……
Im	We don't stamp when we go into the building. Since there are so many people coming and going […] It is only after you have stamped the QR codes you have entered the space.
Researcher	Oh, then this place actually……the space where you stamp your QR code is more strongly [perceived as entrance]?
Im	Yes, you could say that. Where you have to stamp [becomes inside]. Where you don't becomes the outside. Somehow differentiated. Definitely differentiated. This here [outside the building near the entrance door] actually, in fact, you know where you sanitise your hands and check your body temperature, that becomes the entrance, strictly speaking. On the contrary, um, before, the entrance would have been here [the entrance door of the building], since it is outside the building. Inside and outside of a building. But now, it's little changed – the relationship – where you stamp and where you don't stamp.

This line of discussion reminded Park of other urban screens – such as the black boxes, CCTVs, sensors and kiosks – that broke down the existing spatial boundaries.

Park	You know I said just before that the inside and the outside feels [completed separated with the use of the EER], but then also, how can I say this, it feels like all are going to disappear […] somehow, we have CCTVs and whatnot, so all this, all this is getting *stuck together*……increasingly more so.
Researcher	You mean, the boundaries of space are falling apart?
Park	Yes, aren't they falling apart……as urbanisation moves forward […], as the spaces become *denser* and *compressed*……that feeling, you know? (original emphasis)

For Park, the spatial boundaries were dissolving largely due to the many ubiquitous screens that reconfigured the when, where and how of the spatial experiences. The digitally powered urban screens instantly fetched people, goods, services and knowledges from somewhere else to replace them. The very fact that they were lightweight and could be positioned practically anywhere in the urban landscape – on the pavements, inside a restaurant, along the riverside, on the bridge, on the road – instantly connecting and disconnecting, made them the critical part of what Park called 'urbanisation'. For Park, urbanisation was still ongoing, and it was to do with further disassembling, reorganising and compressing existing spatial boundaries.

Related to this are accounts shared by the participants on their experiences in the urban space where such 'boundaries' could not be set up. Describing the particular spatiality of a club, Han explained how, even though the entrances were strictly controlled with the EER, the boundary could not be enacted every corner.

> It's always dark inside [the club] […] because it is so loud, your faces are closer and there happen bodily contacts. […] Unlike the cafés where you can have some distances [between tables] […] you are standing to move about, drink, and go to the restrooms……girls talk and go over their makeup, guys smoke in there……

This description was about the particular spatiality of clubs, but it showed how the boundaries set up by the EER did not have its effect to reach every corner. Han's anecdote of her outdoor activities also illustrated how outdoor space, where the EER could not be effectually installed in times of the pandemic, could be considered even more dangerous than indoor space due to the lack of the perceived boundaries (1.1). As a runner, she and other runners once were invited to run for a sports brand as part of its marketing effort.

> Someone reported it [that we were running in the park as a group], so an officer came to us […] and said that it was not acceptable, that we had to be 5 metres apart from each other. So we ran on this circular track, ten of us 5m, 5m, 5m apart from each other, like a train. We were wearing the same outfit, it was hilarious. And when we were done, he said that we had go home separately. So [he] said "1, 2, 3, three of you go!" "4, 5, 6, go", "7, 8, 9, go". Really, we did that.

The runners did not *enter* a space to be confined into a QR codified boundaries as they would have done if it were an indoor gym. This in turn imposed them to be farther apart from each

other than the usual 2 metres of social distancing (creating invisible, yet physically 'thick' boundaries between each other). 5 metres is a long distance to be imposed among individuals. Han exemplified marathon festivals as space that lacks such boundaries. In marathon festivals, there was not an entrance door and people would move about randomly. Her description was a portrayal of a "dangerous coagulation" (Foucault, 2020: 143) created by unstamped nomads.

Researcher	As you don't really do the EER outdoor,
Han	Never.
Researcher	Would you say that it also plays a part?
Han	Yes. But when you register for a run [in a marathon festival], the records are there, your phone numbers and address, so it's okay. But the people who come along to cheer you up, the acquaintances, they would go back home and spread it [virus], go to work and take the subways, and so on.
Researcher	You mean the athletes are all registered so it's okay,
Han	Yes, yes. But then the people who come along,
Researcher	It becomes unaccountable who have come, you mean,
Han	Anyone can come to see, sweat and spit, yes, so many variables.

People became undetectable outdoor as there was no one entrance or boundary. This was why these spaces were considered to be full of risks. This conversation reminded Han of her recent trip to a beach. As she described, "there was no one entrance" to the beach. All visitors had to wear the waterproof wristlet after making the '080 Rest-Assured-Call', as a marker on their bodies for others to see (as it was in the case of the distribution centre Im worked at). She found it ridiculous because anyone could have come through anywhere; it was just that her bus had happened to stop in front of where this setup was that she went through this process.

> But really, there were endless number of entrances there…..you know, there was not one way [to the beach] (laughs).

As spatial boundaries were digitally constructed, they could be dissembled and reassembled at anytime and anywhere. This in turn created confusion as to where the boundaries lied and how 'firm' they should be regarded. Some participants thought that the physical walls of the buildings no longer so much implied the beginning of the space. Some others criticised the inefficacy of the digital technology in imposing irrelevant boundaries that did not conform to the boundaries of lived experiences. The fact that the *mobile dispositif* could be placed anywhere, regardless of the location of the physical walls of the buildings, compounded on this uncertainty and confusion.

6.2.3. Reproduction of Digital Speed

As frictions were experienced constantly, human actors negotiated and readjusted their body-tool performances in order to overcome the frictions. The posthuman performance of the EER came to engage a certain rhythm or pace. This finding can be interpreted with the concept of *dressage* introduced by Lefebvre (2013). *Dressage*, according to Lefebvre, is a process of bodily repetition through which rhythm is learnt and becomes embodied. What was interesting and different in the findings of this study was that the *dressage* was not only learnt, but constantly *created* by the actors themselves as they were engaging with the different possibilities of using their smartphones. As will be shown, the rhythm sought in the use of the EER primarily had a strong time factor.

The concept of *dressage* is also useful because as the researcher witnessed, beyond the manoeuvre produced through the microphysics of power imposed on the surface between the body and tool (Foucault, 2020), a particular rhythm was reproduced by the digital speed of the smartphone. Indeed to pinpoint where the rhythm (or faster pace) was produced, it was not so much on the surface between the body and the tool – the location Foucault highlighted – but it was internalised to be recalibrated within the smartphone itself; releasing the bodies of some of the previously required performances. The resulting *dressage* was something that appeared as if the participants were just naturally walking along, doing nothing in particular.

This was evident in the performances of data production by the *already networked*.[138] All of them testified that they had tried to speed up the process of generating the QR code on their

138 All those recruited as the *network escaping* were also 'well networked'. Without the researcher knowing before meeting them, two of the participants used the smart watches for everyday activities and were wearing them during their participations in the field research. As all those recruited as the *network escaping* proved themselves to be also the *already networked*, their accounts are included in this discussion. The *already networked* were definitely different from the *yet to*

smartphones by erasing a number of steps. Three ways of doing this were identified: (1) being always logged into the app; (2) being kinetically linked to the app; (3) recording and automating a series of one's performances in the smartphone. All these methods were a way of making their prosthetic-ness to the smart devices even tighter than before.

Firstly, As those *already networked* testified, being always logged into an app one most often used, was the minimum condition to be prosthetic to the smartphone for the use of the EER which often "intrudes the flows of the activities [...]" (Yun, 40) Yun said that he still had to manage it all with the smartphone for the EER, even when he was holding his baby or a luggage in his arms. 'Being already logged in' made a big difference especially for urban dwellers who were in the move and in the 'moments' of doing things. Prostheticness, in this sense, was not only about the physicality of being close to the device but also about being 'logged in' and having the "brain" (Jang, 32) *already running* in the background.

Second method was to extend the prosthetic-ness of the body. The newly invented 'shake function' in particular, kinetically extended the bodily movements to the functionality of the apps for generating the QR code. For both the Naver and the Kakao Talk, as long as the user was logged into it, shaking the smartphone twice instantly generated the QR code. Yun asserted how this was so good for him.

> Who would do it [the EER] if it was so tiresome? No one. […] (He demonstrates the function) you see I go into the Kakao Talk? But usually Kakao Talk apps are already open [in the smartphone]. So, just like this……you shake, here it comes. […] If you don't use this, you would have to press, press, press, and press…….wouldn't do it.

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be networked in their use of technological resources to actively remove the frictions and improve the prosthetic-ness with their smartphones. They all said that their smartphones were very close to their bodies. Yun, 40, felt nervous when he had to turn it off for some time while he engaged in other social activities. He "fiddle[d] with it for no reason". Park, 37, said that he was "addicted" to his smartphone. Ahn, 23, said that he read stuff off the smartphone even while walking and used it during meal time too. Jang, 32, coordinated her iPhone and Apple watch to use them in different situations as they involved different gestures. One major reason for her to have bought the Apple watch was to use it for the EER[138]. Jang emphasised smart devices increasingly represented who we were, because they stored our performances in them[138]. Seo, 24, said that increasingly the smartphones became a way of validating oneself, like an ID card. Im, 27, had replaced his wallet and ID card with his smartphone. Lee, 33, "cannot do" without her smartphone. As a kindergarten teacher, she always had her smartphone in silence mode while her Apple watch nudged her about the incoming calls or texts. Different gestures involved in the two devices were significant in her work environment dealing with children. Han, 25, was a runner and had three smart devices at the time of the field research (smartphone, Garmin watch and Apple watch). She purchased her Apple watch because she wanted to use it for the EER too. As a runner, she was sensitive about how accurately her biometric data were translated.

Figure 40. Yun demonstrated the 'shake function' for generating the QR code. Five shots are selected from the 4 seconds of a video footage to show the series of actions he had taken to get the QR code on the screen. It is a scene where a "meticulous meshing" (Foucault, 2020: 153) occurs.

Ahn also used this 'shake function' to generate the QR code while he participated in the field research. As he walked towards the screen for the EER, he (said he) shook his smartphone to generate the QR code. It was as if he was not doing anything in particular but walking. His shaking movements were subtle and "natural" (Lefebvre, 2013: 38) as if they were part of his walk. Even the researcher missed the moment he was generating the QR code and by the time he placed his smartphone near the screen, it was too late for her to film it. Both Yun and Ahn used the Kakao Talk app for the 'shake function'. Few days after their field research were completed, the Naver launched its own version of shake function. What caught the researcher's eyes as its advertisement was broadcasted on TV, was the catchphrase "Ultrafast Entrance, My Competitive Edge" (Figure 41). Being super-fast in accessing a place was regarded or pronounced as one's competitive edge. It was as if the smartphone was part of your arm, or your arm was part of it. The body was kinetically linked to the smartphone and the smartphone extended your body. Since the Kakao Talk app was usually "already open" (Yun, 40), the action of shaking was instantly converted into the digital binary codes. Yun and Ahn effectively wrote the digital codes by shaking their smartphones.

Figure 41. Advertisement launched by Naver. 2 screenshots from its YouTube Channel (published on 13 August 2021)

The third method was to automate a series of one's performances. It further explained how the prosthetic-ness pursued by those *already networked* was about interweaving your bodily movements to the smartphone even tighter, or internalising performances *in* the smartphone so

that your own bodily performances could become minimal. The completed *dressage* was invisibility. Seo, 24, had figured out a way of using the latest shortcut function of the iPhone to record his actions in his smartphone.

> Ah, in the early days, you had to go into the sites every single time for the EER, so access was hard. Nowadays, there are stuffs for automating it. […] there is an automation function in iPhones. That the smartphone automatically proceeds as you have set it to do what you want […]

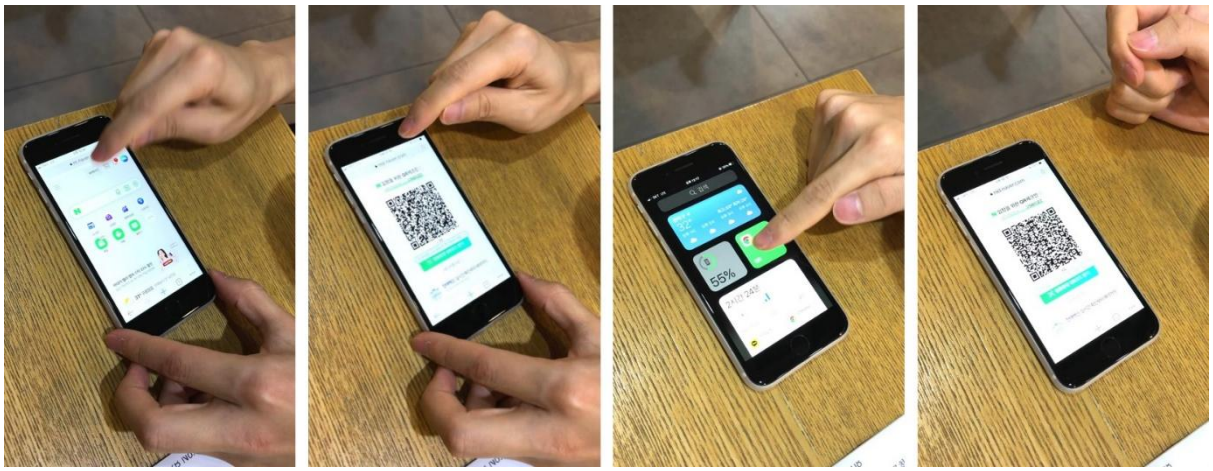


Figure 42. (From left to right) Seo is logged in the Naver app and presses the 'QR Check In' button located on the top right of the screen. When the QR code is generated, he copies the resulting address. He then pastes the address on Chrome and uses the automation function of iPhone to create a button (these actions are not illustrated in this Figure). When he presses the newly created green button, the QR code instantly appears.

Seo demonstrated for the researcher the processes he used for recording his actions on his smartphone. He basically recorded his performances of generating the QR code in the form of an internet address, and then put it in the address bar of Chrome; this particular internet address was used for automation. The result of the automation was a green button on his smartphone as a visual indication of the series of his performances for the EER.

Jang, 32, was another participant who had created a shortcut for generating the QR code in both her smartphone and smart watch so that they both worked "instantaneously." She had made the interface of her Apple watch even more tactile by "implanting" an icon on its 'watch face', or the wallpaper screen (Figure 43). She had actively adjusted her technology ecosystem to be able to use the EER more seamlessly.[139] In Jang's opinion, the materiality of the QR code

139 However, the QR code generated on the Apple watch could not be read by the designated screen in the Starbucks café she chose for the field research. She shifted angles of her arm to have it read but failed. The staff member of the café commented that perhaps the QR code on the watch was too small. Exactly same thing happened with Han, 25, when she attempted generating QR code with her Apple watch during her participation in the field research.

itself was a ‘shortcut’ or a ‘minimised path’ which she further attempted to shorten through the capacities of her smart devices.

> Because, as you know anywhere you go these days……for example, if there is a draw or a contest at a department store……it used to be like, ‘go to our website, register, go in there, click this, do that, and then press the button to enter the contest’. Really, then you have to stand in front [of the poster to do all that] Now, ‘oh, turn on your mobile phone and capture this’ then you go straight to it. […] So the QR code is……oh, I get it. The QR code is the shorted path to reach somewhere.

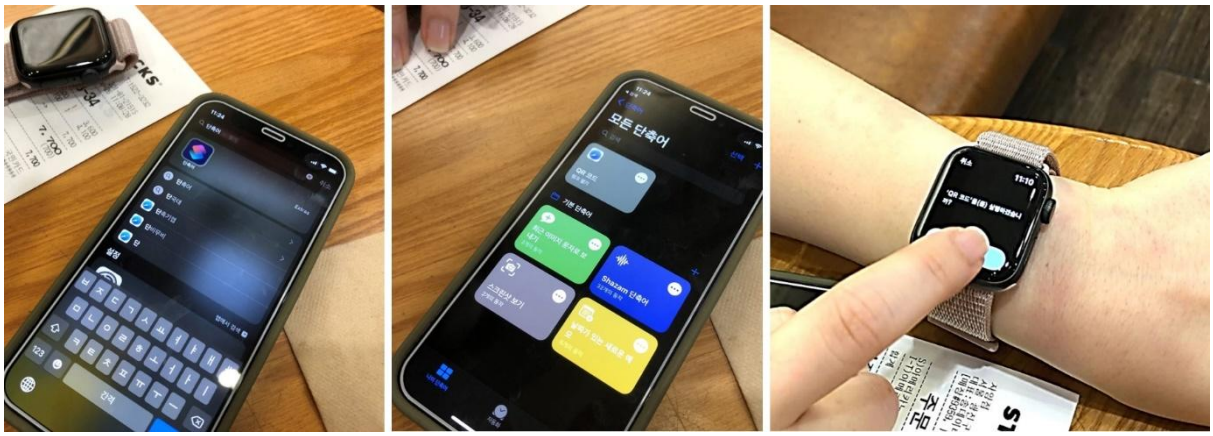


Figure 43. Jang shows how both her iPhone and Apple watch have installed the ‘shortcuts’ for generating the QR code. She has implanted the ‘shortcut’ on the wallpaper screen of her Apple watch for further minimising the procedures on her part.

Instantaneity is an important materiality of digital technology. The QR code made it even more instantaneous, as Jang explained. On top of all this, the *already networked* participants made the time-space for the EER even more reduced or even almost invisible (as shown in the case of Seo) by (kinetically) extending their prosthetic-ness with the smartphone or creating the shortcuts for their performances. This way of “meticulous meshing” (Foucault, 2020: 153) between the body and the device further minimised the performative procedures on the part of the participants. This *dressage* of the smartphone-body was created by the rhythm of digital instantaneity. “They produce[d] their bodies.” (Lefebvre, 2013: 40) The result was a time-space that was almost invisible (at least it was to the eyes of the researcher in the cases of Seo and Yun) or very minimal.

In contrast to those *already networked* who speeded up their manoeuvre by internalising a large part of their performances in their smartphones, those recruited as *yet to be networked*

told different stories.[140] During her participation in the field research, as she attempted, Kim held her smartphone against the designated screen to scan the QR code but was not be able to proceed.[141] When asked during the sit-in interview, Kim replied that she did not know which app she had just used for generating the QR code.

Researcher	Which app, um……did you use, the Kakao app? Which app did you just use?
Kim	I don't know, just what my daughter did [set] for me. I just do as she taught me. (She then shows the screen of the app on her smartphone that she just used for the QR codification)
Researcher	Oh, yes. It is the Kakao app.
Kim	Yes, Kakao.

To become a proficient producer of digital data for the EER required being digitally entangled to the device. The logics and the materialities of the digital needed to be embedded in how one thought (e.g. the processes of doing things) and moved (e.g. pacing oneself so that the other digital device could 'read'). Being digital was an *internalising* process. As all those *already networked* in the field research proved, being networked meant being capable of bringing the efficacy of the digital *into* the hybridity of the smartphone-body. Their faster speed was

140 While all three participants said that their smartphones were critical to have in leading everyday life – the level of their physical entanglements to the device was high – they were not 'digital themselves'. Choi, 66, found using her smartphone often difficult. Yet she called it her "other self" particularly because she increasingly found mobile phone numbers as the most important social identity in contemporary life. Not knowing how to generate the QR code, she had been handwriting personal details. Kang, 60, always had her smartphone "by her side" and had it in 'sound' mode because she needed to make sure of its presence. Yet she had to ask her daughter to download and set the wallet app (which had replaced her "beloved wallets") and to occasionally reset the QR code function for the EER. She did not understand why the QR code "disappeared" sometimes; that is, why it expired. Kim, 66, was unaware of the brand name of her smartphone when asked during the field research. Until recently, she used to "see" her smartphone only twice a day. But since her daughter had downloaded the YouTube app for her and taught her how to use it, it had become her favourite thing. Recently, she spent a large part of her day having it on like a radio. All the three participants expressed a sense of embarrassment about not being able to aptly generate the QR code. They all said they tried to learn how to generate the QR code on their smartphones (e.g. from their children or on the internet) after the arrangements for the field research were made, even though during the recruiting process, the researcher assured them several times that it was no problem not being able to do it at all. They felt they should be able to do it, at least some part of it, before coming to participate in the field research.

141 The QR code had been expired because it was generated too soon. She asked the researcher the reason for this and with some help, renewed the QR code on her smartphone. She then found it difficult to manage the speed of her gesture to make the opposite screen 'read' her QR code. She moved about her hand quickly against the designated screen in embarrassment. She soon gave up and told the researcher, "It's not working." She did not know that she had to hold her smartphone in a way to give some time to the other screen to 'read' the QR code. She was not used to the kind of time taken or the 'rhythm of exchange' for digital devices for their inputs and outputs.

Figure 44. Kim attempted twice to use the EER. The first time, she did not recognise that the QR code had been expired. The second time, the speed of her sweeping motion was not coordinated with the reading time of the digital device (far right).

internalised in the form of being always logged in, kinetically linked to the device (shaking), and automating the device to perform. Unless one's body was prosthetic enough to function with the logic of the digital and embody its efficacy, it was difficult to use the digital device as an *extension* of one's body.

Without this ability to *compress time inside* their smartphones, the speeds of their performances became relatively slower compared to those *already networked* who strived to find ways to make theirs faster and faster. All three talked about the feelings of anxiety that they usually experienced, especially in public space when there were many people behind them in the queue for the EER. Choi, 65, said,

> That *moment*.....you can just turn on the smartphone, but the thought that you have to be very, very quick, because there are people behind you. And I sweat at the thought that I might make mistakes in front of the person [the assistant], and the phone would not turn on [...] (original emphasis)

Kang felt similarly,

> Of course, I feel anxious. Because I am of a certain age, I am slower……the younger ones don't have the experience [of being slow]……

Kim made it clear that it depended on the overall speed of the procession and the ambience of the place:

Researcher	Were you feeling by any chance a sense of anxiety when you were doing it just now?
Kim	Oh, yes. I *was* feeling that (original emphasis).
Researcher	Oh, do you often feel that way? That I have to do this quickly, that……
Kim	That I may *not* be able to do it. I am slower, and I am not good at it, so yes, I feel anxious (original emphasis).
Researcher	I see……how big would you say that emotion is?
Kim	Not very big [here]. But it depends on the situation. If there are many people behind you, then it gets tougher […] Um…….yes, especially when I go to a big hospital.
Researcher	A big hospital? You mean the Seoul National University Hospital?
Kim	Yes, when I go to the university hospital, […] there are many people, so it feels like I have to do it very, very quickly. You know that hospital, for some reason, makes people feel uneasy.
Research	You mean the ambience.
Kim	Yes.
Research	I see……that you have to be very, very quick and move forward, that sort of thing?
Kim	Yes, yes. That sort of thing. And so, um……you have to be prompt, and if you don't do it properly……you are carelessly treated, ill-treated, if you are not proper at it.

Kim found it harder when there were many people in the queue and when the place imposed a certain pace or rhythm of procession. The university hospital, according to Kim, was a place of constant movements and processing. She felt that she needed to move along with the flow, but having to do that as she generated the QR code made her even slower than others. Kim said

that the EER even often impeded her from using some urban facilities. She said she "just turned away" from them when the matter was not that urgent. For her, this spatiality created by the EER was that of a disconnection.

Comparing the two groups – the *already networked* and the *yet to be networked* – indicated that the *already networked* had made the speed of the procession faster and faster through a *dressage* that embodied a particular rhythm and reproduced digital speed at the EER, which those *yet to be networked* by now found too fast to catch up with. Lefebvre (2013) in his book *'Rhythmanalysis: Space, Time and Everyday Life'*, highlights that the time-space, always in the process of becoming, is produced through practice. While the mobile bodies had become the place upon which power was exercised through discipline (Foucault, 2020), the prosthetic embodiment of the smartphones and their digital materialities further determined the postures, gestures and the durations of these manoeuvre. The digitally empowered mobile bodies affected the production of time-space at the EER. As the time minimised, the space also became minimised. *Through* the performance of the actors, the time-space at the sites of the EER diminished.

Chapter 7.

Conclusion

As a case study that interrogates the processes of developing the Electronic Entry Register (EER) as digital infrastructure during covid-19 pandemic, this thesis drew on assemblage theory (Deleuze & Guattari, 2004) to inquire how digitally mediated urban space actually came into being. It discovered that the creation of docile bodies capacitated with the right skills to perform particular manoeuvre and produce digital data, became the most critical element in the production of the EER. Many of the actors in turn, reproduced the digital speed through a *dressage* that made the "meticulous meshing" (Foucault, 2020: 153) between the body and the smartphone even more interwoven. As a result, the time-space at the sites of the EER across the city of Seoul diminished.

Producing digital data for the EER may be just like what people have always been doing through everyday mundane activities. Yet having to actively perform for the EER made the citizens feel more exposed to the realities of digital data production. Building the digital infrastructure as a spatial strategy in the face of the pandemic, brought to light what would have been quite often difficult to account for; largely due to the invisible and illegible materialities intrinsic in the processes of production, collection, and dissemination of digital data.

Digital infrastructure

The assemblage thinking allowed the researcher to conceive the processes of developing the EER as the coming together of different actors and actants. In particular, the distribution of the handheld devices attached to the "mobile public" (Graham, S., 2005: 564) proved to be central in the emergent ways of creating this assemblage. The trained docile citizens produced the QR codes that became the 'dividual' (Deleuze, 1992) which indicated their own mobile bodies real-time, constituting the "apparatus of knowledge." (Foucault, 2020: 126). These data-producing citizens moving across the cities themselves consolidated and channelled the urban circulation. The fact it required everyday lightweight technologies to enact the 'circulatory conduits' (Deleuze & Guattari, 1997) highlighted the 'spatial software' (Easterling, 2014) characterised by the interoperable and expandable materialities of digital technology. This conduit was built

upon the existing technological resources to be immediately mobilised into a particular formation of networks.

The developmental procedures of the EER showed that for a period of less than one month (mid May 2029 – May 2020), the spatial scope and scale of the project constantly changed. Indeed the EER evolved into many forms and shapes –partnerships with platform providers, leveraging on other QR code systems, the '080 Rest-Assured-Call', the three dimensional screen interfaces in Gangnam neighbourhood, to name a few – largely because the South Korean government relayed a significant proportion of the tasks for creating the digital infrastructure to other parties (platform companies, venue operators and the citizens) who were always keen to improve the quality of their own engagements. Indeed it was a process where actors and actants in the assemblage all played critical parts in its development, maintenance and maturation, the final result of which could not be entirely predicted by the government; it had been a "platformising and infrastructuralising process." (Mackenzie, 2019: 1994) This case study indicated an urban infrastructure that was materially different from previous ones. What Brousseau, Marzouki & Méadel (2012) find as characteristic of 'internet governance' – permanent innovation and technical openness of network – need be taken as a departure to rethink and reframe urban infrastructures of the contemporary cities.

Online population built 'internet-up'

The South Korean government chose to network its national population on commercial mobile apps. It had pinned down its online population by simulating it through an already established pool of customers retained by the commercial platforms. In effect, the government 'borrowed' the ready-made populations to speedily build its own networked population. The reasons for this – their online human traffic, their most updated mobile phone numbers, their everyday embeddedness – in fact, often had become sources of criticism against these tech giants for being 'monopolistic'. On the other hand, it also exposed the research participants' preference for leveraging on their existing user behaviours for the use of the EER. For generating the QR codes, participants opted for the mobile apps that they most often used in their everyday life. It "would have been extremely irritating" if the government had asked to download a new app for the QR code, Yun, one of the participants, asserted.

The decision made by the government to request the popular platform providers to embed the QR code function in their mobile apps instead of developing one itself, implied that

securing an online platform, holding a significant proportion of its population – in which the citizens are readily networked to produce digital data daily – could impose a major obstacle for governments in their attempts to build a 'smart city'. In the end, it is the 'big data' collected through the mobile apps – or any networked software of similar sort – that would materialise the smart cities. Reflecting on the potential difficulties of ascertaining a networked population by any government with democratic constitutions, this thesis points out that the task of creating an online population is perhaps too often taken-for-granted 'as already given' in the discourse of smart city.

The episode on the processes of negotiations between the platform company Kakao and the South Korean government in particular, implicated the possible social and political consequences of building smart cities which often involves partnerships with private companies. Even small technical decisions made in contingent manners could change the mechanisms of digital mediations in the urban space. The discrepancies the government and the company had in their motivations for creating a digital platform were also exposed. The platform company saw urban space as opportunity for leveraging their existing platforms. Indeed, city is increasingly perceived by platform companies as a 'platform', which could be built "from the internet up" (Barns, 2020: 14) It is not very different though from what the South Korean government actually did. Its online population was built 'internet-up'.

Would it be far stretched to infer then that, in this sense, the EER had become spaces of Naver and Kakao, as perhaps another three dimensional 'interface' of these platforms? Not so far stretched according to Barns, who claims that "the urban scene becomes a platform ecosystem." (Barns, 2020: 21) To put it simply, one witnessed on the sites of the EER across the city of Seoul a customer's membership to Naver or Kakao replayed and reproduced. Or one could even contend that Naver and Kakao reproduced their interfaces across the country.

Spatial order intrinsic in, and emerging through the EER

The spatial order intrinsic in the EER were discussed as 'fragmented circulation', 'data-based public space', and 'invisible enclosure'. In the course of co-constituting the EER as urban assemblage, the emerging spatialities were perceived by the citizens as 'collapsed linearity', 'liquid boundaries', and 'reproduction of digital speed'. Of all these spatial symptoms, 'invisible enclosure' was the most telling of how the urban space was reorganized and differently experienced through this digital mediation.

Assembling the EER embodied both the elements of *discipline* (Foucault, 2020) and *control* (Deleuze, 1992). As Foucault (2020) himself pointed out, the different shapes of power transiently co-existed to complement each other. The mobile bodies were trained to manoeuvre in particular ways to produce the right kind of data (discipline); the data produced at the surface between the body and the tool in turn became the means of normalising the individuals into the 'dividual' codes (control); which produced and accumulated knowledge to create 'invisible enclosure' effected by networks of gaze (discipline).

The participants perceived the gaze differently, largely affected by their previous experiences and particular spatial arrangements of the place. Sometimes the gaze came from the actual eyes of the human bodies; sometimes particular spatiality created the gaze; gaze was sometimes substituted by sound that could be heard by everyone in the room; gaze was created on the stickers or the wristlets displayed on the arms; gaze was made on photographs illustrating social distancing; gaze was embedded in the endless inflow of 'disaster text messages'. Indeed, the gaze did not have to be 'located' somewhere but could be constantly produced anywhere.

Tracking and tracing system empowered by digital technology and communications networks enclosed individuals where they were. This real-time production of gaze through faster and finer grained networks came to constantly recreate contours of control. The citizens of Seoul during the pandemic were enclosed in a way that there was not an unconnected body. It was a way of interiorizing *through* the networks to encapsulate the bodies on the move.

Posthuman bodies as a unit of analysis in urban studies

Another important finding from this case study is the significance of posthuman bodies as a unit of analysis in urban studies. There are billions of ubiquitous technologies and sensors that are embedded in the built environments, of course, but they are far from the only ways of realising the techno-social assemblages in digitally mediated cities.

Urban dwellers as posthuman bodies were central in understanding the production of this digital infrastructure. The South Korean government, more than anything, put much effort into creating data-producing citizens. Indeed, the government could quite readily adopt this spatial planning and strategy *because* of the already established 'intimate entanglements'(Barns, 2020) between the smartphones and the citizens in their everyday life.

The research participants went through negotiations to make sense of their own engagements. Some reproduced the manoeuvre into particular *dressage* which embodied digital speed of the smartphone and made the time-space at the sites of the EER almost invisible. Some others controlled the levels of digital data production and exchange, depending on how well they were already networked for example, through the electronic payment systems (Han, 25) and mobile apps for reserving seats in the cities (Seo, 24). These findings on how the research participants played particular agentic roles in the processes of data production were even more telling, because the research design of this study had established these human actors in a limited sense as the co-constituents of the EER. Having said that, the differentiated capacities embodied by these bodies ultimately reproduced a relation of strict subjection. Power as *potentia* and as *potestas* as conceptually distinguished by Braidotti (2017) proved to be not necessarily distinct from one another in practice. As Foucault pointed out, "an increased aptitude and an increased domination" (Foucault, 2020: 138) got played out *through* these posthuman bodies taking a critical place in this urban assemblage.

Furthermore, differentiated bodies emerged through digital mediations. The *yet to be networked* had difficulties to catch up with the speed that the *already networked* came to enjoy. The disparities in their embodied speeds grew larger as those *already networked* continuously strived to 'create' minimal action in their engagements with the EER by adopting the "latest way of doing it" (Jang, 32). These findings on differentiated bodies certainly differed from the homogenous projections of 'smart citizens' as often imagined in the smart city discourse. Posthumanist perspective in this way, helps one to avoid a 'view from nowhere' (Haraway, 1990) or 'aerial view' (Rose, 2016b). The study of digitally mediated cities overall, and especially the discourse of smart city, could take the posthumanist perspective more productively.

Final note on this discussion of posthumans as a unit of analysis: it was proposed in Chapter 2, that Barad (2003)'s proposal of rejecting the idea of 'mediation' was to be discussed *with* the results of this case study. As the findings from this study reveal, the posthuman-ness cannot be discussed without the materiality of the media. In fact, the particular level of prosthetic-ness and the capacities of the smartphones as media determined the posthuman performances differently. Barad's conceptualization of tools as completely permeated into the body risks neglecting the possibilities that linkages between the body and the tool could create 'frictions' (Rose, 2016a). Furthermore, the kinds of frictions could take different forms depending on the

kinds of bodies. Therefore, this study suggests to sustain the notion of 'mediation' in explaining the different ways of interlinking the body and the tool.

On further studies

This study proposes three main implications for researchers concerned with digitally mediated urban spaces. Firstly, there is a need to re-question and re-imagine what cities are in times when there are more people owning smartphones than cars. The vast amounts of data generated by the smartphone-holding people every day produce knowledge that reconstitute the realities of the urban. As it was the case in the dawn of industrialisation when the modern cities completely restructured through new technology, the materialities of the digital technology are to reset what cities are yet again. As the newly built concrete pavements in the 19th century was put into effects by being walked on, the latest technologies of today are enacted by the different mobile bodies of the 21st century. For this reason, how we conceptualise the relationalities of the body and the tool is critical to future research agenda of digitally mediated cities. This is not to fall victim to a technological determinism that often posits the discourse of digitally mediated cities as technologically subsumed domain; but rather to interrogate how the everyday urban engagements are performed through and enacted by the body-tools. It is clear that we will always be 'always-on', and the smart devices that constitute the body-tool posthuman will continue to remain central to our urban life in the decades ahead. Perhaps their form factors may slightly change, or a new mode of interactivity may emerge. Yet the posthuman body as the unit of data production will remain relevant, if not more so in the coming years. This entails more than an issue of mere theoretical dispute, as there are important practical implications too. Who do digital technology and communications networks produce and what do cities become as a result? Which dimensions of the urban spaces are prone to be reproduced by posthuman interactions, and how can these be studied?

Secondly, there emerges an inquiry around how urban population can be imagined when there are various efforts, public and private, to reconfigure it through digital technology and communications networks. There is a likelihood that the capacities of private platform companies to mobilise any set of online population is much bigger than those of a country. Indeed, the platform companies' capacity "to embed and orchestrate machine intelligence into our everyday lifeworld far outstrips the capacity of any sovereign state." (Barns, 2020: 127) This opens up further questions for the future of urban planning. Questions for relevant future

research may include for example, how would the ever growing presence of such platforms affect the logic of a centralised urban governance? Is planning becoming inseparable from digital programming? How could an understanding of platform enable a transition from planning that "exhaustively determine action in advance towards relatively open-ended platforms able to respond flexibly to changes"? (Williams, 2015: 227)

Thirdly, there is a need to consider how digital data, which arguably will become the seeds for change in the ways cities are organised and operate, can open doors for 'representational space' (Lefebvre, 1991). This is questioning how the spatialities produced by the digital could be "lived through" (Lefebvre, 1991: 39) by the citizens, the very producers of the data, when the data themselves cannot quite easily be perceived by them. Indeed, as many times discussed throughout this thesis, the illegibility of the QR code and the general invisibility of the data processes alienated the very producers of the data. The value-laden performances of data production were much left under-perceived. Park said "I can't feel it", and many others gave up on understanding where the data went after the QR code scan. This sense of alienation in turn raised feelings of anxieties, doubts and powerlessness. If the relationships between the producer and the products continue this way, the potential gap between the 'representation of space' – that is, the "conceptualized space, the space of scientists, planners, urbanists, technocratic subdividers and social engineers" (Lefebvre, 1991: 38) – in the forms of smart cities and smart citizens for example, and the 'representational space' – the lived space of the digital – can be severely widening. Urban planners and theorists indeed need to pay attention to the particular materialities of the digital in order to envisage possible implications of pursuing socio-spatialities produced by the digital.

Space is always the object of purposeful intervention. The EER, as a spatial planning and strategy employed by the South Korean government in the face of the pandemic could be regarded just as a temporary intervention in the urban space. However, it in fact drew on all the social, political and technological resources in order to produce a particular ways of organising the urban. Urbanisation is still ongoing, as Park, one of the research participants remarked. Digital technology enacted through the posthuman bodies and reproduced as an unexpected *dressage*, is likely to take a critical place in this process, in the decades to come.

Reference

Agamben, G. (2009). *"What Is an Apparatus?" And Other Essays*. Stanford, Calif. : Stanford University Press.

Ash, J., Kitchin, R., & Leszczynski, A. (2018). Digital Turn, Digital Geographies? *Progress in human geography, 42*(1), 25-43.

Barad, K. (2003). Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter. *Signs: Journal of Women in Culture and Society, 28*(3), 801-831.

Barns, S. (2020). *Platform Urbanism : Negotiating Platform Ecosystems in Connected Cities* (1st ed. 2020.. ed.). Palgrave Macmillan.

Bevir, M. (1999). Foucault and Critique: Deploying Agency against Autonomy. *Political theory, 27*(1), 65-84.

Braidotti, R. (2017). Posthuman Critical Theory. *Journal of posthuman studies, 1*(1), 9.

Braudel, F. (1982). *The Structures of Everyday Life: Civilization and Capitalism, 15th-18th Century* (1st U.S. ed.. ed. Vol. 1). New York : Harper & Row.

Brenner, N., Madden, D. J., & Wachsmuth, D. (2011). Assemblage Urbanism and the Challenges of Critical Urban Theory. *City (London, England), 15*(2), 225-240.

Brousseau, E., Marzouki, M., & Méadel, C. (2012). *Governance, Regulations and Powers on the Internet*. Cambridge University Press.

Choi, S., & Hong, J.-h. (2017). A Study on Factors Influencing the Elderly Suicide Rates in Urban and Rural Areas: Policy Design: Focusing on the Difference between Urban and Rural Areas. *Journal of Governmental Studies, 2016*, 321-366.

Corbin, J. M., & Strauss, A. L. (2008). *Basics of Qualitative Research : Techniques and Procedures for Developing Grounded Theory* (3rd ed.). SAGE.

Crang, M., & Graham, S. (2007). Sentient Cities: Ambient Intelligence and the Politics of Urban Space. *Information, communication & society, 10*(6), 789-817.

Cresswell, T. (2010). Towards a Politics of Mobility. *Environment and planning. D, Society & space, 28*(1), 17-31.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design : Choosing among Five Approaches* (4th ed.,International Student ed.. ed.). SAGE.

Crouch, M., & McKenzie, H. (2006). The Logic of Small Samples in Interview-Based Qualitative Research. *Social Science Information, 45*(4), 483-499.

Deleuze, G. (1992). Postscript on the Societies of Control. *October*(59), 3-7.

Deleuze, G. (1995). *Negotiations, 1972-1990*. Columbia University Press.

Deleuze, G., & Guattari, F. (1997). City-State. In N. Leach (Ed.), *Rethinking Architecture : A Reader in Cultural Theory*. Routledge.

Deleuze, G., & Guattari, F. l. (2004). *A Thousand Plateaus : Capitalism and Schizophrenia*. London New York : Continuum.

Dho, S. Y. (2017). Thinking About Smart City in the Way of M. Foucault's 'Problematization'. *Konggan kwa sahoe, 59*(59), 15-38.

Easterling, K. (2014). *Extrastatecraft : The Power of Infrastructure Space*. Verso.

Eriksson, K. (2005). Foucault, Deleuze, and the Ontology of Networks. *The European legacy, toward new paradigms, 10*(6), 595-610.

Evans, J., & Jones, P. (2011). The Walking Interview: Methodology, Mobility and Place. *Applied geography (Sevenoaks), 31*(2), 849-858.

Farias, I. (2009). *Introduction: Decentring the Object of Urban Studies*. London

New York : Routledge.

Farías, I. (2011). The Politics of Urban Assemblages. *City (London, England), 15*(3-4), 365-374.

Ferrando, F. (2013). Posthumanism, Transhumanism, Antihumanism, Metahumanism, and New Materialisms: Differences and Relations. *Existenz, 8*, 26-32.

Foucault, M. (1980). *Power/Knowledge : Selected Interviews and Other Writings, 1972-1977* (1st American ed.). Pantheon Books.

Foucault, M. (2007). *Security, Territory, Population : Lectures at the Colláege De France, 1977-78*. Palgrave Macmillan.

Foucault, M. (2020). *Discipline and Punish : The Birth of the Prison* (A. Sheridan, Trans.). Penguin Books.

Glaser, B. G. (1992). *Emergence Vs Forcing : Basics of Grounded Theory Analysis*. Sociology Press.

Graham, M., Zook, M., & Boulton, A. (2013). Augmented Reality in Urban Places: Contested Content and the Duplicity of Code. *Transactions - Institute of British Geographers (1965), 38*(3), 464-479.

Graham, S. (2005). Software-Sorted Geographies. *Progress in human geography, 29*(5), 562-580.

Guattari, F. (1995). *Chaosmosis : An Ethico-Aesthetic Paradigm*. Bloomington, Ind. : Indiana University Press.

Haraway, D. (1985). A Manifesto for Cyborgs: Science, Technology, and Socialist-Feminism in the 1980s. *Socialist Review, 15*, 65-107.

Haraway, D. (1990). *Simians, Cyborgs, and Women: The Reinvention of Nature*. Routledge.

Hetherington, K. (1997). In Place of Geometry: The Materiality of Place. In K. Hetherington & R. Munro (Eds.), *Ideas of Difference : Social Spaces and the Labour of Division*. Blackwell Publishers/The Sociological Review.

Hogle, L., F. . (2005). Enhancement Technologies and the Body. *Annual review of anthropology, 34*(1), 695-716.

Hogle, L. F. (2005). Enhancement Technologies and the Body. *Annual review of anthropology, 34*(1), 695-716.

Ibrahim, Y. (2021). *Posthuman Capitalism : Dancing with Data in the Digital Economy*. London

New York, New York : Routledge.

Jackson, K., & Bazeley, P. (2019). *Qualitative Data Analysis with Nvivo* (3rd ed.). SAGE.

Jauréguiberry, F. (2000). Mobile Telecommunications and the Management of Time. *Social Science Information, 39*(2), 255-268.

Jon, I. (2020). Deciphering Posthumanism: Why and How It Matters to Urban Planning in the Anthropocene. *Planning theory (London, England), 19*(4), 392-420.

Joss, S., Sengers, F., Schraven, D., Caprotti, F., & Dayot, Y. (2019). The Smart City as Global Discourse: Storylines and Critical Junctures across 27 Cities. *The Journal of urban technology, 26*(1), 3-34.

Jung, H. (2014). Let Their Voices Be Seen: Exploring Mental Mapping as a Feminist Visual Methodology for the Study of Migrant Women. *International journal of urban and regional research, 38*(3), 985-1002.

Kamalipour, H., & Peimani, N. (2015). Assemblage Thinking and the City: Implications for Urban Studies. *Current Urban Studies, 3*, 402-408.

Karimimoshaver, M., Ahmadi, M. A., Aram, F., & Mosavi, A. (2020). Urban Views and Their Impacts on Citizens: A Grounded Theory Study of Sanandaj City. *Heliyon, 6*(10), e05157-e05157.

Kim, H. J. (2017). Expansion and Transition of Urban Planning Practice in the Smart Age. *Konggan kwa sahoe, 59*(59), 86-127.

Kim, Y., Chen, Y., & Liang, F. (2021). Engineering Care in Pandemic Technogovernance: The Politics of Care in China and South Korea's Covid-19 Tracking Apps. *New media & society*, 1-19.

Kitchin, R. (2020). Civil Liberties or Public Health, or Civil Liberties and Public Health? Using Surveillance Technologies to Tackle the Spread of Covid-19. *Space & polity, 24*(3), 362-381.

Kitchin, R., & Dodge, M. (2005). Code and the Transduction of Space. *Annals of the Association of American Geographers, 95*(1), 162-180.

Kitchin, R., & Dodge, M. (2011). *Code/Space : Software and Everyday Life*. MIT Press.

Klauser, F., Paasche, T., & Söderström, O. (2014). Michel Foucault and the Smart City: Power Dynamics Inherent in Contemporary Governing through Code. *Environment and Planning D: Society and Space, 32*(5), 869-885.

Krippendorff, K. (2013). *Content Analysis : An Introduction to Its Methodology* (3rd ed.). SAGE.

Larkin, B. (2013). The Politics and Poetics of Infrastructure. *Annual review of anthropology, 42*(1), 327-343.

Lefebvre, H. (1991). *The Production of Space*.

Lefebvre, H. (2013). *Rhythmanalysis: Space, Time and Everyday Life* (G. Moore & S. Elden, Trans.). Bloomsbury Publishing Plc.

Legg, S. (2011). Assemblage/Apparatus: Using Deleuze and Foucault: Assemblage/Apparatus. *Area (London 1969), 43*(2), 128-133.

Mackenzie, A. (2003, 20 March 2003). Transduction: Invention, Innovation and Collective Life. Retrieved from https://www.lancaster.ac.uk/staff/mackenza/papers/transduction.pdf 26 April

2021

Mackenzie, A. (2019). From Api to Ai: Platforms and Their Opacities. *Information, communication & society, 22*(13), 1989-2006.

Mayhew, S. (2004). *A Dictionary of Geography* (4th ed.. ed.). Oxford [England]

New York : Oxford University Press.

McFarlane, C. (2011a). Assemblage and Critical Urbanism. *City (London, England), 15*(2), 204-224.

McFarlane, C. (2011b). The City as Assemblage: Dwelling and Urban Space. *Environment and planning. D, Society & space, 29*(4), 649-671.

McQuire, S. (2006). The Politics of Public Space in the Media City. *First Monday*.

Milan, S. (2020). Techno-Solutionism and the Standard Human in the Making of the Covid-19 Pandemic. *Big Data & Society, 7*(2).

Munster, A. (2006). *Materializing New Media : Embodiment in Information Aesthetics*. University Press of New England.

Neuendorf, K. A. (2017). *The Content Analysis Guidebook* (2nd ed.). SAGE.

Park, J., & Yoo, S. (2017). Critical Understanding of Current Implication of Smart City Focuing on Information and Communication Technology, Governance, Sustainability and Urban Development. *Konggan kwa sahoe, 59*, 128-155.

Plogør, J. (2008). Foucault's "Dispositif" and the City. *Planning theory (London, England), 7*(1), 51-70.

Rich, E., & Miah, A. (2009). Prosthetic Surveillance: The Medical Governance of Healthy Bodies in Cyberspace. *Surveillance & society, 6*(2), 163-177.

Rose, G. (2001). *Visual Methodologies : An Introduction to the Interpretation of Visual Materials*. Sage.

Rose, G. (2016a). Rethinking the Geographies of Cultural 'Objects' through Digital Technologies: Interface, Network and Friction. *Progress in human geography, 40*(3), 334-351.

Rose, G. (2016b). Smart Cities and Drone Warfare: A Shared Visuality? Retrieved from https://visualmethodculture.wordpress.com/2016/02/18/smart-cities-and-drone-warfare-a-shared-visuality/ 20 December 2020

Rose, G. (2017). Posthuman Agency in the Digitally Mediated City: Exteriorization, Individuation, Reinvention. *Annals of the American Association of Geographers, 107*(4), 779-793.

Rose, G., Raghuram, P., Watson, S., & Wigley, E. (2020). Platform Urbanism, Smartphone Applications and Valuing Data in a Smart City. *Transactions of the Institute of British Geographers*.

Salter, M. B. (2013). To Make Move and Let Stop: Mobility and the Assemblage of Circulation. *Mobilities, 8*(1), 7-19.

Scott, J. C. (1998). *Seeing Like a State : How Certain Schemes to Improve the Human Condition Have Failed*. New Haven : Yale University Press.

Seale, C. (2002). Quality Issues in Qualitative Inquiry. *Qualitative social work : QSW : research and practice, 1*(1), 97-110.

Shaw, D. B. (2018). *Urban Space and the Posthuman Imaginary* (1 ed.). Routledge.

Storper, M., & Scott, A. J. (2016). Current Debates in Urban Theory: A Critical Assessment. *Urban studies (Edinburgh, Scotland), 53*(6), 1114-1136.

Thrift, N. (2014). The 'Sentient' City and What It May Portend. *Big Data & Society, 1*(1), 205395171453224.

Tonkiss, F. (2011). Template Urbanism: Four Points About Assemblage. *City (London, England), 15*(5), 584-588.

Vaughan, A. (2020, 17 April 2020). There Are Many Reasons Why Covid-19 Contact-Tracing Apps May Not Work. *New Scientist*. Retrieved from https://www.newscientist.com/article/2241041-there-are-manyreasons-why-covid-19-contact-tracing-apps-may-not-work

Verhoeff, N. (2012). *Mobile Screens: The Visual Regime of Navigation* (1st ed. Vol. 18). Amsterdam University Press.

Verhoeff, N. (2017). Urban Interfaces: The Cartographies of Screen-Based Installations. *Television & new media, 18*(4), 305-319.

Vollstedt, M., & Rezat, S. (2019). An Introduction to Grounded Theory with a Special Focus on Axial Coding and the Coding Paradigm. In *Compendium for Early Career Researchers in Mathematics Education*

Webster, M. D. (2016). Examining Philosophy of Technology Using Grounded Theory Methods. *Forum, qualitative social research, 17*(2).

Williams, A. (2015). Control Societies and Platform Logic.("Postscript on the Societies of Control" by Gilles Deleuze). *New Formations*(84-85), 209-227.

Wilmott, C. (2020). *Mobile Mapping : Space, Cartography and the Digital*. Amsterdam University Press.

Zook, M. A., & Graham, M. (2007). The Creative Reconstruction of the Internet: Google and the Privatization of Cyberspace and Digiplace. *Geoforum, 38*(6), 1322-1343.

Appendix

면담 녹취 전사 기록지 (일부 발췌)

연구 과제명	디지털 기술로 매개되는 도시 공간과 이동하는 몸: 코로나19 유행병 시기 QR코드를 생산하는 포스트휴먼과 공간형성에 대한 연구
파일명	Audio_NE04
녹취 일시	2021년 8월 25일, 09:45–10:40
녹취 장소	솔샘역 2번출구 (서울 강북구 미아동) – 이디야커피 삼양사거리점 (서울 강북구 미아동)
녹취자	이환경
연구참여자 (식별번호)	Han (NE04)
청취 불능 및 강조 표시	청취 불능은 (...) / 강조는 굵게 / 말줄임은 .....로 표시
문서 매수 및 단어 수	29매 / 7,160 단어

본 문서는 연구 책임자가 직접 녹음한 자료에 근거하여 생산된 문서로 제시된 자료와 그 내용이 일치함을 증명합니다.

2021년 8월 26일

연구책임자: 이환경

본 문 시 작

발화자	내용
연구자	자주 가시나요, 이디야 카페에는요?
NE04	어.....일주일에 한 두 번쯤은 가는 거 같아요, 매일 가지는 않지만.

연구자 아, 자주 가시네요. 거기서 작업을 많이 하시나 봐요?

NE04 아, 네. 맞아요.

연구자 아, 네. 그.....전자출입명부, 갑작스럽게 느껴지시겠지만 (웃음), 전자출입명부에 대해서 그냥 일반적인 질문 좀 하려고 하는데요,

NE04 아, 네네.

연구자 이거 코로나 생기고 난 다음에 어.....전자출입명부 쓰면서 서울에서 여기저기 이동하고 다니실 때, 그 전과 비교해서 좀 다른 게 느껴지시나요? 차이점이 있다면.....아무거나 다 괜찮아요.

NE04 (웃음) 예전에는 전자출입명부에도 그 QR코드만 있었던 거 같은데, 예전에는.....아, 요즘 들어서는 전화번호로 전화를 하면은, 되는 게 있더라구요. 그런 게 좀 더 편한 거 같아요.

연구자 아.....

NE04 그런 게 좀 더 많이 늘어 나기도 했고. 예전에는 QR코드 찍었는데, 요즘에는 QR코드가 없어진 데도 되게 많이 있어요.

연구자 아.....예를 들면 어떤 곳인가요?

NE04 어 저는 이쪽 가면 맘스터치라는 햄버거 가게가 있는데, 예전에는 QR코드 찍는 데가 있었는데, 저번 주에 가니까 QR코드 기계가 없어지고 전화번호가 있더라구요. 이제 앞으로 여기로 전화로 해야 한다, 라고 해가지고, 뭐 저는 둘 다 편하니까 상관없지만 다른 분들은 뭐.....조금 어색하게 느껴지셨을 수도 있겠죠?

연구자 스스로는 그래도 전화번호가 더 편하다고 느끼세요?

NE04 네, 맞아요.

연구자 어떤 면에서 그러세요?

NE04 QR코드는 핸드폰이 조금 인식이 좀 느리게 되거나, 아니면은 다른 거 하고 있다가 갑자기 QR코드를 인식해야 돼가지고 조금 힘든데, 전화번호는 그냥 거기 있는 번호만 눌러가지고 한 2초 정도? 그거 밖에 안 걸리니까.....

연구자 더 짧게 걸린다.

NE04 네, 맞아요.

연구자 작동도 더 편리하고.

NE04 네, 맞아요.

연구자 아, 그러시군요. 아, 그.....클럽 생활이라고 그러면 어떨지 모르겠지만 (웃음),

NE04 괜찮아요, 괜찮아요.

연구자 혹시 그런 거에 대해서 좀 이야기를.....해 주시겠어요?

NE04 네, 괜찮아요. 아, 최근에는 전혀 간 적이 없고, 저도 지금.....8월, 8월 인가요?

연구자 네.

NE04 클럽이나 유흥시설이, 술집도 포함이 되는 거죠?

연구자 네네. 다 괜찮아요.

NE04 술집은 거의 그래도 일주일에 한번씩은 가니까 (웃음). 어.....사실 거기 QR코드를 안 찍는 곳이 조금 있더라구요. 그게 사실 필수가 아닌가, 필수가 아닌가요? 저도 잘 몰라가지고.

연구자 필수인 거 같아요, 제가 알기로는.

NE04 이거를 기록하지 않으면은 과태료 같은 게 내는 게 없나 봐요. 가끔은 오픈을 하자마자 바로 들어가, 요즘은 사실 업무시간이 짧아지니까, 9시까지로 바뀌어버리니까 친구들이랑 일찍 만나서 밥을 먹거나 술을 먹거든요. 오픈 시간에 가면은, QR코드를 측정하지 않아요. (웃음) 그래서 저희가 (...) 이야기 해가지고, 혹시 이거 안 해도 되냐, 본인들도 까먹으셨다고.....

연구자 아.....

NE04 차라리 그냥 요즘은 자리에 번호가 있어가지고, 그렇게 해 주시는 게 저희도 좀 더 편하고 그 사장님도 편할 수 있을 거 같아서.

연구자 아.....그냥 식당마다 다 번호가 있어서,

NE04 네네. 요즘 다 자리마다 번호가 다 있더라구요?

연구자 자리마다요?

NE04 네, 어제 간,

연구자 전화번호가 다 달라요?

NE04 아뇨, 다 똑 같은 건데, 그러니까, **안보이니까** 자리마다 이렇게,

연구자 적어놓는군요.

NE04 네네. 어제 갔던 데도 종업원 오셔가지고 여기 있는 번호로 전화하세요, 이래가지고,, 되게 좋더라구요. 예전에는 막 줄 서가지고, 번호 막 보고 그랬는데.....요즘 많이 좋아졌어요.

연구자 그러면은 클럽은, 이거랑 관련돼서 생각되시는 게 어떤 상황이셨나요?

NE04 음.....클럽은 (...) 거기는 아예 초반에 간 거라서 무조건 QR코드였었어요. 그래서 조금 더 딜레이가 됐었죠. 어떤 분들은 QR코드 인식이 잘 안 되거나, (...) 멀리 대야 되거나 가까이 대야 되거나 그런 것들도 있고, QR코드를 가입하지 않은, 전화번호 인증을 가입하지 않은 사람들은 더 오래 걸렸죠. 그 때 시간이 조금 더. 전화번호 인증하고, 인증번호 입력해야 돼가지고 (...) 혼란이 있었던 거 같아요. 그리고 또 (웃음) 몰래 들어가는 사람들도 있고. 뭐, 자기는 걸리면 안 된다. 회사에 걸리거나, 뭐 그러면 안 된다. (웃음) 이런 사람들 있어가지고,

연구자 네. 친구 분들이요, 아니면.....

NE04 다른 사람들이요. 저희는 조금 친구들끼리 엄격하게 (웃음)

연구자 그 클럽이라는 공간 있잖아요, 그 공간이 뭐, 예를 들어서 카페라든가 도서관이라든가 동사무소라든가, 이런 다른 공간과 다른 특징이 있다면은, 본인이 생각하시기에 어떤 걸까요?

NE04 무조건적으로 마스크를 벗을 수 밖에 없죠.

연구자 클럽이요?

NE04 네, 일단은 거기에는 무조건 바가 있기 때문에.....물을 마시거나 뭐, 거긴 또 흡연을 한다거나, 흡연실이 따로 있기 때문에, 담배를 핀다거나 뭐, 말을 하는데 너무 시끄러워서 안 들려서 마스크를 벗고 얘기한다거나. 이거는 무조건적으로 마스크를 벗을 수밖에 없는, 사실 그런 곳이라서. 물론 본인이 아, 나 오늘 무조건 안 벗겠다, 하면은 뭐 짧게 즐길 수 있는 가능성도 있겠지만 (...) 마스크를 써도 좁은 공간에서 움직이니까 숨도 좀 쉬기 힘들어질 거고, 코나 입이 노출하는 상황이 많아지겠죠. 클럽은 피할 수 없는 거 같아요. 코로나에 걸리기에 피할 수 없는.

연구자 네.....밀도라든가, 공간 크기라든가, 이런 것도 좀 차이가 있을까요?

NE04 저도 잘은 모르겠지만, 헬스장도 막 면적 1미터마다 얼마씩 뭐, 인원이 있어야 된다, 라고 하는데 사실 그거는 의미가 없는 게, 그냥 그 공간에 들어가면 걸리는 거 아닌가. (웃음) 저는 잘 모르겠지만. 그렇게 느껴져 가지고, 사실 뭐, 사람이 많거나 아무리 적거나 해도 코로나 확진자가 있다면은, 거기에, 그냥 다 걸리는 게 아닌가, 라는 생각을 저는 하고는 있어요.

연구자 아.....그 코로나 전이라고, 그러니까, 꼭 코로나가 (...) 아니더라도, 클럽이라고 하는 그 공간 자체 있잖아요, 그것이 가지고 있는 뭔가, 특별함? 뭔가 좀 다른 점, 이런 게 있을까요? 항상 어둡다 라든가.....그런 식의? 그런 게 생각 나는 게 있으신가요?

NE04 그러니까 뭐, 그렇죠, 일단 무조건 항상 어둡고, 시끄럽고 대화가 안 통하니까, 서로 되게 더 접촉이 되는 거죠. 너무 시끄러우니까, 서로 말이 안 들리니까 얼굴은 좀 더 가까워지게 되고, 그럼 또 불필요한 신체 접촉이 일어나게 되고, 뭐 비말이, 감염을 퍼트릴 수 밖에 없는 거리가 될 수밖에 없어요. 시끄럽고.....또 거기 있으면 또 음료수를 마셔야 되는 상황이니까, 카페 같은 데는 어느 정도 거리를 둘 수 있으니까 괜찮은데,

연구자 테이블이 있으니까,

NE04 네, 맞아요. 거기는 또 서서 움직이면서 마시고, 또 거기에 화장실에 다 같이..... 여성분들은 화장을 고치고 남성분들은 담배를 피니까. 그게 조금은 조금.....다른 곳과는 다른 차이점이 있죠. 그 정도로.

연구자 네네. 아, 그렇군요. 이번에는 또 다른 질문으로 넘어갈 텐데요 (웃음), 현재 사용하고 계시는 스마트폰 브랜드랑 모델명이,

NE04 애플이구요, 아이폰 12프로 입니다.

연구자 네트워크는 문제 없으시죠?

NE04 네, 전혀 문제 없습니다.

연구자 네, 일상생활에서 가장 많이 사용하고 계시는 모바일 앱 세 개 꼽으면 어떤 걸까요?

NE04 어플, 어플 말씀하시는 거죠?

연구자 네, 어플이요.

NE04 카카오톡, 네이버, 그거 말고는.....글쎄요, 어.....아, 인스타그램이요.

연구자 아, 인스타그램. 그렇게 세 개. 본인의 스마트폰에 대해서 생각을 하실 때 얼마나 자신의 기기에 대해서 가깝게 느끼세요?

NE04 오.....저는 백 퍼센트 가깝게 느껴가지고.....

연구자 네?

NE04 백 퍼센트, 완전. 저랑 떼어낼 수가 없는. 그래서 애플, 애플과 연동하는 시계도 있어야 하구, 제가 운동을 하기 때문에 운동시계를 또 차고 다녀요. (웃음) (애플워치와 가민워치를 찬 팔을 보여줌)

연구자 아 (웃음) 그러시군요. 이거를.....이걸로 QR코드는 안 하세요?

NE04 어, 할 수도 있는데, 이게 사이즈가 너무 작아서 인식이 안되더라구요.

연구자 아, 그러세요?

NE04 해봤었습니다.

연구자 아, 해보셨어요?

NE04 이걸로 저기서 찍어도 돼요.

연구자 아, 한번 해볼까요, 그러면은?

NE04 네, 근데 인식이 절대 안 돼요. 저도 사실 이거, 바꾼 지 얼마 안 돼 가지고.....QR코드가 된다 그래가지고, 아 너무 편하겠다, 싶어서 대봤는데, 이게 베젤 자체가 너무 사이즈가 작아가지고, 인식이 안 된다고 하더라구요. 저기 들어가볼까요?

연구자 네네.

NE04 (애플워치로 QR코드를 생성하려고 하는데 인증이 요구됨) 오랜만에 하니까 (...) 하네요. (인증절차를 진행함) 너무 번거로워요. (웃음) 이거 인증하는 것도 너무 번거롭고, 저번에 쓰던, 써봤던 거를 쓸 수 밖에 없는 거 같아요.

연구자 아, 항상 써오던 거.....번거로워서.

NE04 네, 맞아요.

.....전자출입명부 생성 후.....

연구자 아까 저거 하실 때 네이버 쓰셨죠?

NE04 네.

연구자 평소에도 네이버 쓰시……왜 네이버로 하세요?

NE04 어……제일, 사실 초등학교 때부터 썼던 게 네이버라 가지고, 저는 개인적으로…….

연구자 항상 그게 있는 거네요.

NE04 네 예전부터 썼던 게 그냥 남아가지고, 그냥 다른 거를 별로 도전하지 않는거죠

연구자 아, 초등학교 때부터 쓰셔가지고……

NE04 네. (웃음)

연구자 그럼 그 때 이메일 계정 다 그대로,

NE04 네. 다, 네이버.

연구자 그러면은 카톡을 많이 쓰시지만은 그걸로 넘어가려는 생각은 안 하시는 거네요.

NE04 그쵸. 아까처럼 계속 번호 인증해야 돼가지고……플랫폼을 바꾸기에는 너무 귀찮아진 거죠. 순간순간 빨리 해야 될 수도 있는데.

연구자 아 그러시군요. 아까 하실 때 네이버에는 이미 로그인이 돼있던 상태이셨어요?

NE04 네, 맞아요.

연구자 항상 로그인을 해 놓으시는,

NE04 네네. 그렇게 하지 않으면 빨리 할 수가 없어가지고.

연구자 아……빨리 하는 게 되게 중요 하시죠?

NE04 그쵸. 예, 좀, 저 혼자 가면 괜찮은데, 다른 분들이 다 같이 갔을 때 저 때문에 기다린다거나 그러면 조금 미안해지기도 하고,

연구자 뒤에 막 사람들 줄 서있으면은 조급해지시는……

NE04 네네. 또 눈치보고 그래야 돼가지고, 사실은 저는 전화번호 입력하는 게 더 편한 거 같아요.

연구자 그러면 전화번호를, 친구분들이랑 그렇게 뭐 식사하러 가셨을 때…… (같이 앉아있는 테이블 구석에서 전화번호를 발견함) 아, 여기도 있네요 (웃음)

NE04 (웃음) 요즘 다 좋아져가지고, 다 있더라구요.

관찰기록지 (일부 발췌)

연구 과제명	디지털 기술로 매개되는 도시 공간과 이동하는 몸: 코로나19 유행병 시기 QR코드를 생산하는 포스트휴먼과 공간형성에 대한 연구
파일명	Video_YN02
관찰 일시	2021년 8월 16일, 15:55–16:35
관찰 장소	서울혁신파크 (서울 은평구 녹번동) – NC백화점 불광점 (서울 은평구 대조동)
관찰자	이환경
연구참여자 (식별번호)	Kang (YN02)

본 문서는 연구 책임자가 직접 관찰하고 녹화한 자료에 근거하여 생산된 문서로 제시된 자료와 그 내용이 일치함을 증명합니다.

2021년 8월 18일

연구책임자: 이환경

본 문 시 작

전자출입명부의 공간 구성과 현장

전체적인 공간의 구성은 어떠한가? (입구, 출구, 스크린 비치 장소, 줄의 방향과 모양, 단계 구성 등)

- 백화점의 여러 개 입구 중 한 개를 빼고는 다 폐쇄하고 QR코드 작성, 수기명부, 또는 전화번호 세 개의 등록 방식을 제공하고 있음. (다만 차를 타고 들어오는 경우, 주차장 입구에 전화번호가 큰 포스터에 적혀 붙어 있으나, 관리하는 직원이 없음. 참여자와 약속 전 본 백화점에 차를 미리 주차한 연구자는 해당 전화번호를 잊고 등록을 누락하였음.)
- 큰 백화점 정문을 들어서서 이중문을 통과하면 정면에 전자출입명부와 함께 체온측정기기가 있음. 체온측정기기에서 체온을 측정하고 한 발자국 왼쪽으로 이동하여 QR코드를 스캔하는 구성임.

- 수기명부는 관리자가 앉아 있는 책상 위에 놓여있음.
- 전화번호는 안내 포스터에 크게 적혀 있음.
- 줄은 5-6명 정도 서 있으며, 모든 사람이 입구에 들어서자 마자 핸드폰을 꺼내는 모습을 보임.

타 장소와 비교했을 때 이 장소의 특이점이 있는가? (예:전자출입명부 생성 시 요구되는 행동, 배치 등)

- 지상으로 들어오는 사람들만 통제한다는 점이 특이함. 지하 주차장으로 들어오는 사람들의 전화번호 등록을 관리하는 사람이 없어 자율적으로 이루어질 수 밖에 없어 누락이 많을 것으로 예상됨.
- 정문 빼고는 지상의 다른 문들은 폐쇄되어 있어, 전체적으로 항아리와 같은 공간을 형성함.

QR코드 스캔을 위한 스크린은 어떻게 배열되어 있으며, 몇 개가 있는가?

- 정문을 들어서면 QR코드 스캔을 위한 스크린이 사람의 키 높이의 거치대에 거치되어 있으며 1개가 있음.
- 사용자가 많은 시설임을 감안할 때 스크린을 여러 개 구비할 수도 있지만, 일렬로 줄을 선 사람들이 한 명씩 스캔을 할 수 있는 구성임.

전자출입명부 생성 장소에 도우미가 있는가? 이동의 흐름을 통제하는가? 어떠한 지침을 주고 있는가?

- 관리자 한 명이 테이블 뒤에 앉아 있으며, 방문자 한 명 한 명을 감시하는 느낌을 주지는 않음. QR코드 스캔 후 '인증되었습니다' 라는 자동 음을 듣고, 충분히 파악할 수 있으며 줄을 서서 한 명씩 통과하고 있는 형태이기 때문에 한 명이라도 스캔을 하지 않으면 감지할 수 있을 것으로 파악됨.
- 다만 전화번호로 전화를 하는 것도 권장하고 있기 때문에, 모든 방문자의 등록을 철저히 감시하기에는 한계가 있어 보임. 자율적으로 등록하기를 권장하는 구성임.

줄은 얼마나 긴가? 줄은 얼마나 빨리 이동하는가?

- 줄은 5-6명 정도로 형성되어 있으며 빨리 이동하고 있지는 않지만, 일정한 속도로 앞으로 움직임.

동작과 실행

참여자의 자세와 몸짓, 움직임 등 실행의 순서는 어떠한가?

- 참여자는 줄에 서서 가방에서 핸드폰을 꺼내고 터치를 하여 QR코드를 생성하고, 정면에 보이는 QR코드 스캔을 위한 스크린에 자신의 스마트폰을 마주하여 QR코드를 스캔함.

참여자의 동작과 실행을 살펴보았을 때 줄을 기다리는 다른 개인들과 비교해서 다른 점이 있는가?

- 큰 어려움 없이 타인들과 비슷한 속도를 유지하며 핸드폰을 작동하여 전자출입명부를 작성함.

참여자는 스마트폰을 어떻게 작동하는가? (작동 속도, 단계 등)

- 참여자는 자녀가 미리 설정해둔 네이버 앱을 터치하여, 줄을 선 다른 이들과 비교했을 때 특별히 느리지 않은 속도로 QR코드를 스캔함.

참여자는 무엇을 해야 할지 이미 알고 실행에 바로 옮기는가?

- 참여자는 무엇을 해야 할지 알고 있고, 입장하자 마자 핸드폰을 작동함.

줄이 움직이는 속도나 도우미의 반응 등, 참여자의 실행에 영향을 미치는 요소가 있는가?

- 줄이 이동하는 속도에 보폭을 맞추어 QR코드 스캔을 위한 스크린을 향해 걸어가고, 앞선 사람과 비슷한 속도로 QR코드를 스캔함.
- 백화점 입구에 들어서자 마자 명부 작성을 위한 줄이 보이기 때문에 자연스럽게 다른 사람들과 줄을 형성함. 다른 사람과 다른 움직임을 하면서 명부를 작성하지 않는 것은 매우 눈에 띄는 행동이 될 수 있는 상황임.

문제와 전략

참여자가 어려움을 느끼는 순간이 있는가? 그러하다면 참여자는 문제를 어떻게 해결하는가?

- 어려움을 느끼는 순간이 없음.

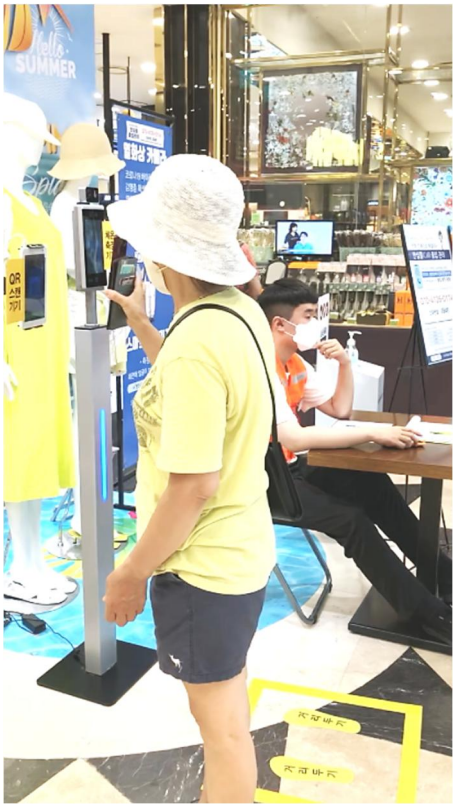
참여자는 성공이나 실패와 같은 감정을 표현하는가?

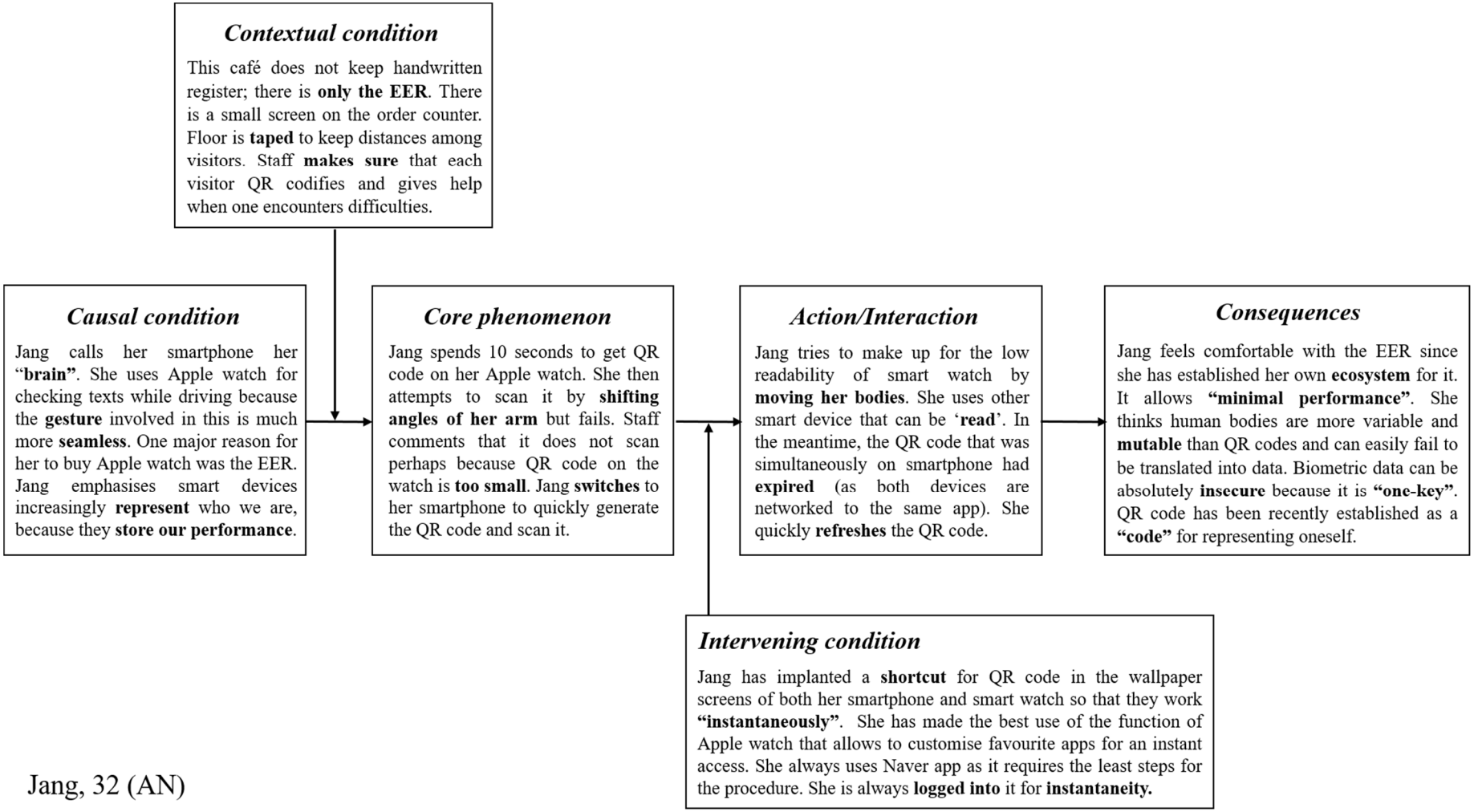
- 참여자는 미소를 지으며 성공의 감정을 표현함.
- 자녀가 설정해 둔 네이버 앱이 가끔 유효기간이 지나, QR코드를 생성하지 않을 경우가 있음을 걱정하였음.

참여자가 특정 전략이나 작전을 구사한다면 무엇인가?

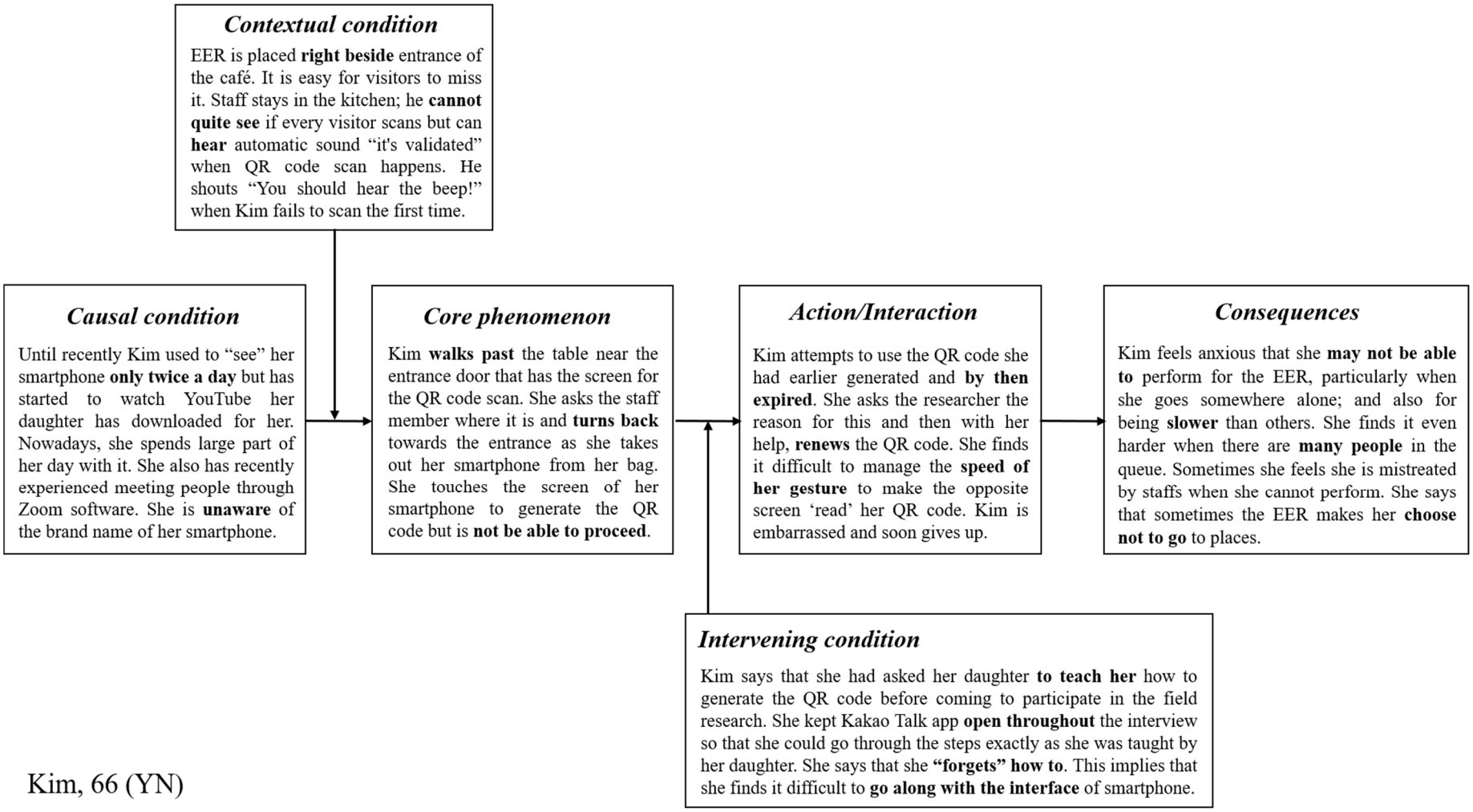
- 참여자는 자녀가 설정해 준 네이버 앱을 사용하여 QR코드를 생성하지만, 유효(인증)기간이 지나면 스스로 설정을 하는 것을 아직 배우지 못했음.
- 유효기간이 지나 QR코드 생성이 되지 않을 경우에는 수기명부나 전화번호를 사용한다고 함.

녹화된 영상의 주요 스크린샷

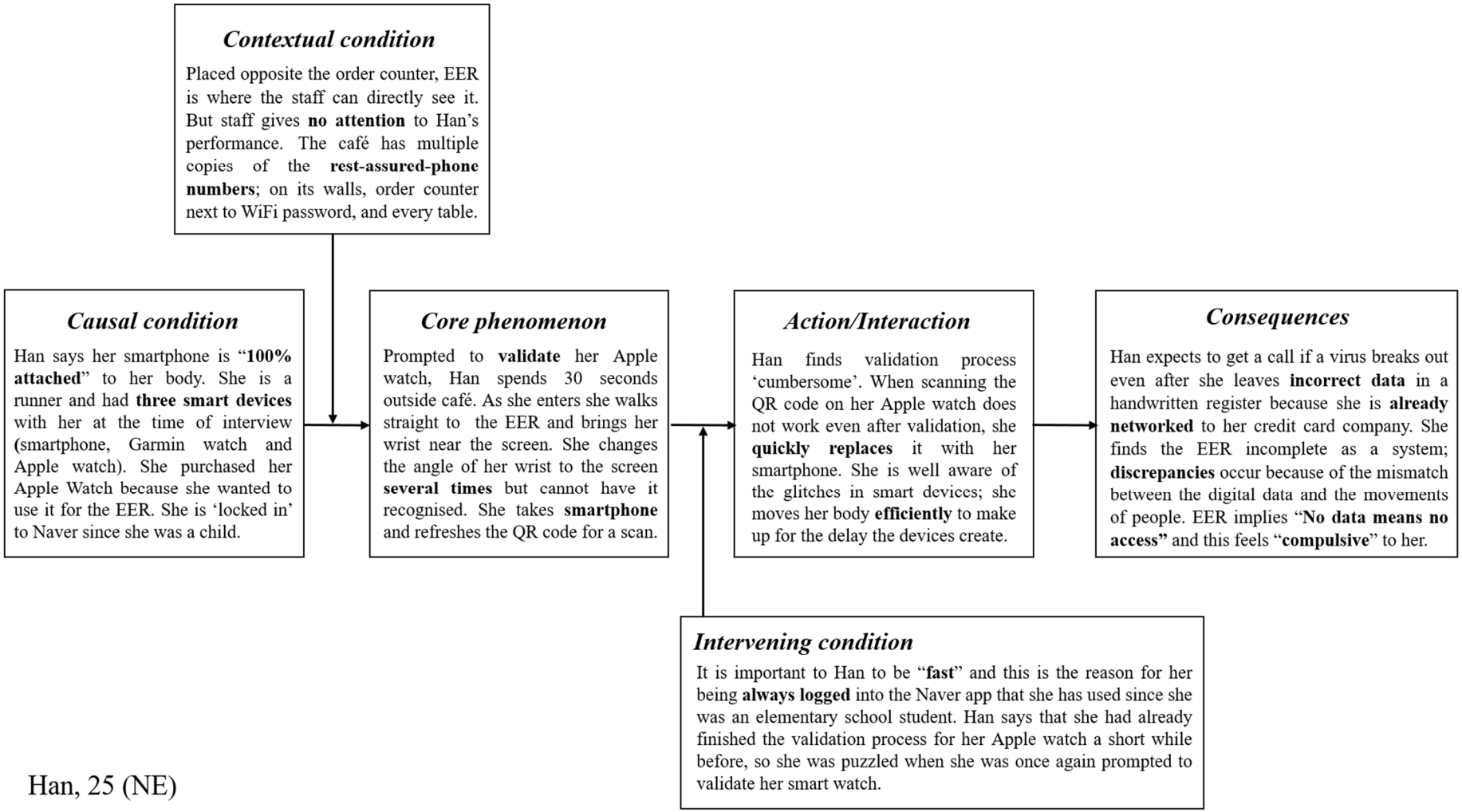



Contextual condition
This café does not keep handwritten register; there is only the EER. There is a small screen on the order counter. Floor is taped to keep distances among visitors. Staff makes sure that each visitor QR codifies and gives help when one encounters difficulties.
Causal condition
Jang calls her smartphone her "brain". She uses Apple watch for checking texts while driving because the gesture involved in this is much more seamless. One major reason for her to buy Apple watch was the EER. Jang emphasises smart devices increasingly represent who we are, because they store our performance.
Core phenomenon
Jang spends 10 seconds to get QR code on her Apple watch. She then attempts to scan it by shifting angles of her arm but fails. Staff comments that it does not scan perhaps because QR code on the watch is too small. Jang switches to her smartphone to quickly generate the QR code and scan it.
Action/Interaction
Jang tries to make up for the low readability of smart watch by moving her bodies. She uses other smart device that can be 'read'. In the meantime, the QR code that was simultaneously on smartphone had expired (as both devices are networked to the same app). She quickly refreshes the QR code.
Consequences
Jang feels comfortable with the EER since she has established her own ecosystem for it. It allows "minimal performance". She thinks human bodies are more variable and mutable than QR codes and can easily fail to be translated into data. Biometric data can be absolutely insecure because it is "one-key". QR code has been recently established as a "code" for representing oneself.
Intervening condition
Jang has implanted a shortcut for QR code in the wallpaper screens of both her smartphone and smart watch so that they work "instantaneously". She has made the best use of the function of Apple watch that allows to customise favourite apps for an instant access. She always uses Naver app as it requires the least steps for the procedure. She is always logged into it for instantaneity.

Jang, 32 (AN)


Contextual condition
EER is placed right beside entrance of the café. It is easy for visitors to miss it. Staff stays in the kitchen; he cannot quite see if every visitor scans but can hear automatic sound "it's validated" when QR code scan happens. He shouts "You should hear the beep!" when Kim fails to scan the first time.
Causal condition
Until recently Kim used to "see" her smartphone only twice a day but has started to watch YouTube her daughter has downloaded for her. Nowadays, she spends large part of her day with it. She also has recently experienced meeting people through Zoom software. She is unaware of the brand name of her smartphone.
Core phenomenon
Kim walks past the table near the entrance door that has the screen for the QR code scan. She asks the staff member where it is and turns back towards the entrance as she takes out her smartphone from her bag. She touches the screen of her smartphone to generate the QR code but is not be able to proceed.
Action/Interaction
Kim attempts to use the QR code she had earlier generated and by then expired. She asks the researcher the reason for this and then with her help, renews the QR code. She finds it difficult to manage the speed of her gesture to make the opposite screen 'read' her QR code. Kim is embarrassed and soon gives up.
Consequences
Kim feels anxious that she may not be able to perform for the EER, particularly when she goes somewhere alone; and also for being slower than others. She finds it even harder when there are many people in the queue. Sometimes she feels she is mistreated by staffs when she cannot perform. She says that sometimes the EER makes her choose not to go to places.
Intervening condition
Kim says that she had asked her daughter to teach her how to generate the QR code before coming to participate in the field research. She kept Kakao Talk app open throughout the interview so that she could go through the steps exactly as she was taught by her daughter. She says that she "forgets" how to. This implies that she finds it difficult to go along with the interface of smartphone.

Kim, 66 (YN)


Contextual condition
Placed opposite the order counter, EER is where the staff can directly see it. But staff gives no attention to Han's performance. The café has multiple copies of the rest-assured-phone numbers; on its walls, order counter next to WiFi password, and every table.
Causal condition
Han says her smartphone is "100% attached" to her body. She is a runner and had three smart devices with her at the time of interview (smartphone, Garmin watch and Apple watch). She purchased her Apple Watch because she wanted to use it for the EER. She is 'locked in' to Naver since she was a child.
Core phenomenon
Prompted to validate her Apple watch, Han spends 30 seconds outside café. As she enters she walks straight to the EER and brings her wrist near the screen. She changes the angle of her wrist to the screen several times but cannot have it recognised. She takes smartphone and refreshes the QR code for a scan.
Action/Interaction
Han finds validation process 'cumbersome'. When scanning the QR code on her Apple watch does not work even after validation, she quickly replaces it with her smartphone. She is well aware of the glitches in smart devices; she moves her body efficiently to make up for the delay the devices create.
Consequences
Han expects to get a call if a virus breaks out even after she leaves incorrect data in a handwritten register because she is already networked to her credit card company. She finds the EER incomplete as a system; discrepancies occur because of the mismatch between the digital data and the movements of people. EER implies "No data means no access" and this feels "compulsive" to her.
Intervening condition
It is important to Han to be "fast" and this is the reason for her being always logged into the Naver app that she has used since she was an elementary school student. Han says that she had already finished the validation process for her Apple watch a short while before, so she was puzzled when she was once again prompted to validate her smart watch.

Han, 25 (NE)

국문초록

본 연구는 코로나19 유행병에 대한 대응 차원에서 인구의 흐름을 통제하기 위해 한국 정부가 구축한 '전자출입명부'의 형성 과정을 도시 아상블라주 (urban assemblage)로서 연구하였다. 특히 포스트휴머니즘 관점을 도입하여 스마트폰을 보철(prosthesis)로서 체화하고 디지털 데이터를 생산하는 행위자에 주목하였다.

정부가 요구하는 데이터를 적시에 생산하는 인구를 창출하는 것이 전자출입명부 개발과정의 핵심임을 밝혔다. 이는 다양한 방식의 대국민 커뮤니케이션을 통해 이루어졌다. 또한 정부는 기업의 모바일 플랫폼에 QR코드 기능을 탑재하여 기업의 '온라인 고객'을 국가의 '온라인 인구'로 대체하였다. 이 과정은 전 인구가 연결된 네트워크 장(場)을 형성하고, 일상적으로 데이터를 생산하게 하는 것이 얼마나 어려울 수 있는지를 반증하며, 스마트시티 담론에서 온라인 인구 구축에 대한 명확한 전제가 미비함을 지적하게 한다. 또한 디지털 기반시설의 주요 구성 요소로서 도시 스크린 (urban screen), 데이터 생산자, 레버리지 효과를 제시하였다.

이동 중 스마트폰을 작동하여 지식을 생산하는 유순한 신체 (Foucault, 2020)는 전자출입명부를 도시 아상블라주로서 구축하는 핵심 동력이 되었다. 서울 시민을 대상으로 한 전자출입명부 현장연구는 QR코드가 이동하는 몸을 가리키는 가장 중요한 '분체(dividual)' (Deleuze, 1992)로서 작동함을 확인하였다. 인간의 눈으로 판독 불가한 QR코드 패턴이 상징하듯, 디지털 데이터의 비시인성은 생산, 수집, 산출, 활용의 전 과정에서 데이터 생산자들을 소외시켰는데, 이는 불안감과 무력감으로도 표출되었다. 본 연구에서 관찰한 데이터생산자들은 스마트시티 담론에서 '스마트 시민(smart citizen)'으로 표상되는 정치적 주체들과는 거리가 있었다.

마지막으로, 논문은 QR코드화된 도시공간의 공간성을 두 가지 측면에서 논의하였다. 전자출입명부에 내재된 공간적 질서에 대한 측면과, 변화된 도시공간 구조변화의 측면이다. 전자출입명부에 내재된 공간적 질서는 '파편화된 순환 (fragmented circulation)', '데이터기반 공공 공간(data-based public space)', '비가시적 봉인성 (invisible enclosure)'으로 논의하였다. 변화된 도시공간성에 대한 경험은 '선형성의 붕괴 (collapsed linearity)', '액체적 경계 (liquid boundaries)', '디

지털 속도의 재생산 (reproduction of digital speed)’으로 제시하였다.

본 연구는 코로나19 유행병의 방역을 위해 한국 정부가 구축한 전자출입명부를 디지털 기반시설 조성의 사례로 연구하며, 그 개발과정에 있어 디지털 데이터를 생산하는 시민을 창조하는 것이 핵심이었음을 밝혔다. 르페브르(2013)가 실천을 통해 시공간이 생성된다고 하였듯 디지털을 체화한 신체는 디지털 속도를 도시공간에 재현하였는데, 본 사례연구는 이러한 도시공간의 재조직이 신체-스마트폰을 통해 이루어지는 현상을 포착할 수 있었다. 이에 따라 본 연구는 디지털 기기를 보철로서 체화한 포스트휴먼을 도시공간 연구에 있어 유효한 연구 단위로서 제안하며, 디지털 도시를 연구함에 있어 도시계획학적 함의가 적지 않음을 제시한다.

주요어: 아상블라주, 디지털 기반시설, 장치, 포스트휴머니즘, 스마트시티, 모바일, 코로나19, QR

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