Smart Cities with a Nordic Twist?
Public Sector Digitalization in Finnish Data-Rich Cities

Abstract

The article studies the urban digitalization and smart city development in the context of Nordic society. The exploration focuses on city officials' views concerning the two largest cities in Finland, Helsinki and Espoo. Both cities are investing heavily on urban digitalization, and they are also building specific smart city districts. The central contexts for the study are the Nordic welfare state model and Finnish cities' role in society as crucial service providers. The article follows especially conceptualizations connected to urban data which have been highlighted in recent critical smart city research and are also at the heart of the studied cities' digitalization programmes.

Keywords:

1 Introduction

In this article, we identify the specific circumstances of Nordic cities as they come face to face with urban digitalization and smart city agenda. More specifically, we investigate the topic in the context of the Finnish model, where cities are responsible for providing a wide array of services to their citizens. The motivation of this article lies in the notion that there is an urgent need to study ongoing smart city (referred to also as SC) development in different contexts in order to gain more nuanced understandings of its local manifestations and practical impact; only through this we can escape overly utopian or dystopian stances. It is of utmost importance to begin to grasp best practices and think how they could be applied in critical, context-sensitive and pragmatic ways (cf. McFarlane and Söderström, 2017). It is clear that SC can take different forms within different political, social, cultural and economic contexts. The European Union constitutes a completely different environment for SC development than for example, the United States, China or India. The Nordic Countries with their welfare state model, high living standards and highly developed ICT infrastructure and know-how are their own specific context within Europe and the EU.

In recent years, the smart city as an urban development agenda fueled by information and communication technologies has significantly increased its popularity globally. The motivations and objectives of these initiatives are mostly economic: to streamline city processes, enhance resource management, reduce the cost of services, accelerate economic growth and urban competitiveness, and so forth (Aguilera, 2017; Abella et al., 2017). At the same time, critical academic scholarship around the topic has increased immensely, expressing also some very worried tones. Increasingly,

the critique is directed to neoliberal logic underlying many smart city initiatives (e.g. Cardullo and Kitchin, 2019). There are also burning questions related to the ownership and use of data that digitalizing cities produce (Zuboff, 2015). In the most dystopian interpretations, we arrive into an urban version of Bentham's panopticon: city inhabitants become merely data producers whose every movement, action and emotion are tracked, analyzed in opaque ways and used to benefit companies and (authoritarian) governments (e.g. Kobie, 2019; Williamson, 2015).

Our analysis focuses on Finland which is one of the Nordic countries. The article scrutinizes more closely two cities: The City of Helsinki and the City of Espoo. They are the two largest and fastest growing cities in Finland, Helsinki currently having roughly 653.000 inhabitants and Espoo 289.000. They are also among the wealthiest, enabling them to be at the forefront of digitalization in Finnish cities. (Kunnat käännekohdassa?, 2020.) They have, for example, established specific positions for this purpose. Further, they are also building specific smart city districts from the scratch – *Smart Kalasatama* (Helsinki) and *Kera* (Espoo), the latter being still under planning. The Cities are part of the metropolitan region of Finland, which has a population of 1,5 million and consists of several different cities that are in practice merged. Nevertheless, each city still has its own administration and follows its own strategies.

The SC development of the capital city Helsinki has been going on for years and at the first glance it seems to be researched extensively (e.g. De falco et al., 2019; Hielkema and Hongisto, 2013; Jaakola et al., 2015; Laitinen et al., 2017; Markkula and Kune, 2015). Nevertheless, what seems to be missing is a more critical urban studies perspective; a rare example is provided by literary studies scholar Lieven Ameel (e.g. Ameel, 2016). SC development of Espoo, in turn, seems to be much less studied (e.g Erkkilä, 2014). Overall, critical urban studies focusing on either Helsinki or Espoo as smart cities are scarce. Furthermore, the Cities' newest digitalization programmes are such a recent phenomenon that we can say this article is one of the first academic studies seizing them. Our analysis is based on qualitative methods and materials. The primary data set consists of 12 thematic semi-structured interviews, carried out with officers in charge of digitalization and smart city development of Helsinki and Espoo. In addition, we refer to official web pages and other documents related to digitalization and smart city development.

The article is structured as follows: after introducing briefly materials and methods, we first present a review of contemporary smart city literature focusing especially on smart cities as landscapes of data production and harvesting. We continue by introducing the Nordic welfare state model that acts as the broader societal context for our study, and trace the role of cities as organizations in Finnish society. Next, we illuminate the central ideas of urban digitalization strategies of the studied cities, and provide a brief introduction to their SC development. In the following chapters 4.2 and 4.3 we dive in the actual empirical analysis, and present through interview material how Finnish expert actors representing two different cities perceive urban digitalization and smart city development. Finally, we ask how these perceptions contradict or resonate with the critical smart city literature, and is there something we could learn from the Finnish cases.

2 Materials and methods

The main set of data consists of twelve thematic semi-structured interviews, conducted with the high-level city officials of the Cities of Helsinki and Espoo. Our research approach in this paper draws mainly from ethnography (McGranahan, 2018; Skinner, 2013), in a sense that through the data, we aim to provide rich, detailed accounts of the interviewed experts' views and perceptions; we are not interested so much on how official strategies were put on paper (though we refer to these documents as well) but how the people holding power in Cities and making decisions make sense of urban digitalization and smart city development, how they contextualize them, and what they see as important. All the interviewed experts were working in positions where they either contributed to the digitalization and smart city development of the City, or followed it closely. We aimed at interviewing experts having the same responsibilities in each city, and we ended up having six interviewees from Helsinki and six from Espoo. The interviews took place during late spring of 2019 and winter 2019–2020.

We took care of all the ethical procedures such as informing participants of our respective research projects, and utilized an informed consent form. Each interview lasted from one hour to two and a half hours, and they all were recorded and transcribed in order to enable in-depth analysis. Transcriptions were analyzed with thematic analysis and using inductive approach (e.g. Patton, 2014). For the purposes of this article, we focused on tracing how interviewed experts conceptualized 1) urban digitalization, 2) smart city development, and 3) the relationship between these two. The interviews have been anonymized and are referred to as H1-H6 (Helsinki) and E1-E6 (Espoo). As a secondary data set we are also analyzing Cities' strategies and other policy documents that can be found online. Most of them have English translations that are referred to in the reference list.

3 Smart City and the Nordic Context

3.1 Act politely and produce data: Smart cities as landscapes of data production and harvesting

Cities that have declared themselves as "smart" can be found everywhere globally (e.g. Angelidou, 2017; Willis & Aurigi, 2020). Earlier, we have described smart cities as "urban areas which are being purposefully infused with digital technologies and infrastructures" (removed for blind review). Batty et al. (2012) have defined a smart city simply as "a city in which ICT is merged with traditional infrastructures, coordinated and integrated using new digital technologies". While these definitions describe simply a state of affairs where urban environments and digital technologies mix in some manner, some definitions have also described value-driven goals as requirements for smart cities. For example, Caragliu et al. (2009) argue: "A city is smart when investments in human and social capital and traditional (transport) and modern (ICT) infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance." Similarly, the European Union has defined a smart city as "a place where traditional networks and services are made more efficient with the use of digital and telecommunication technologies for the benefit of its inhabitants and business" (EC 2019). "Smart", then, continues to be a hard-to-define concept (Joss, 2019; Luque-Ayala, 2019).

According to Mora et al. (2017), there have been two major strands of research literature on smart cities in 1992–2012. The first of these can be described as the holistic and critical, European style smart city literature, and the other as the technology and business-oriented literature issuing mostly out of North America. In the former, critical body of work, Ylipulli & Luusua (2019) have identified at least three areas of interest. For our purposes here, we can formulate these as: (1) smart cities as platforms for data harvesting, (2) smart cities and citizens' agency and (3) smart cities as landscapes of dataveillance. Data, agency, citizenship and privacy, then, could be seen as crucial issues in the critical smart city literature. These themes are pertinent to our work too; additionally, however, we would like to position ourselves within an interdisciplinary, *critical-pragmatic* approach to smart city research. Indeed, there is an emerging literature of outliers in the smart city literature that have already called for, and have begun to work within, what we might call a third strand of smart city research. For example, Drapalova & Wegrich (2019), McFarlane & Söderström (2017) and Ylipulli & Luusua (2019) have called for a more pragmatic, yet critical approach to smart cities.

This is very much evidenced in the work of Cardullo and Kitchin (2019), who argue that the smart city agenda is a form of neo-liberal urban planning; more precisely, that smart city agendas "enact a blueprint of neoliberal urbanism and promote a form of neoliberal citizenship". Kitchin and Dodge (2011) also argue that digital technologies are seductive because they promise rewards for their use, while at the same time they condition their user through automation and various forms of control. This is visible also in the work of Attah et al. (2019) who interviewed Uber drivers in Washington, D.C. These individuals were keenly aware that they were being exploited for data collection — however, they were apparently unable to raise any collective or individual measures against their "employer", or rather, the platform for which they were working. (Attah et al., 2019). Overall, empirical accounts suggest that smart city agendas and projects, and urban digitalization in general, is tightly coupled with neo-liberal notions of citizenship. This is a concern, since these accounts suggest a mode of citizenship where individuals are not democratic citizens with inalienable rights and duties; rather, the expectation may well be that "smart" citizens act politely and be personally empowered in a narrowly defined manner, without much real agency or political power (Cardullo & Kitchin, 2019). This is important for our work in a Nordic context, which, as we will briefly describe later on, is not primarily or historically neo-liberal. This raises interesting questions for the integration of smart city technologies into this context; for example, the aspects that Cardullo and Kitchin speak of be incorporated, translated or diffused?

This critical literature is nevertheless also in danger of being sidelined by more practice-oriented, business-led research. After all, new technologies are indeed very seductive, and offer real benefits in and of themselves to their users in the form of free services and added convenience. Furthermore, there are also incredibly large interests at play here; it has become something of a mantra to state that data is the new oil (The Economist, 2017, Matsakis, 2019), and this metaphor certainly seems justified. This is a result of what Zuboff (2015, 2019) has termed the *informating* ability of digital technologies. By this, she refers to the capability of digital technologies to produce data (information) concerning its own use — and, by way of doing this, also about its user(s). Analogue technologies, while also being able to automate tasks, are not able to function in this way in any meaningful fashion. This is foundational to our understanding of smart cities, as the ability to informate turns urban

environments into hotbeds of data production through digitalization. This data production can then be commodified or otherwise utilized.

Commodifiable data, then, could be described as being the real major asset of any large internet company, such as Google or Facebook. These data are collected from our mundane everyday activities, such as smartphone and desktop use. Now, this is also moving to private and semi-private modes of urban transportation: Attoh et al. (2019) point to the connection between Uber and smart city data collection in Washington, D.C. Meanwhile, Tesla and other automotive companies collect data from users' private journeys (Fazzini & Colodny, 2019). As a general result of these developments, Zuboff has argued that we have, in fact, created a novel form of capitalism, dubbed surveillance capitalism (Zuboff 2015). This, we argue, offers a useful explanation for the great push for digitalization in cities.

What is of particular interest to us is the significance of these developments in Nordic welfare state contexts. The traditional Nordic welfare state model, which focuses on citizen rights and public services, seems to clash fundamentally with the neoliberal ideas of citizenship that have been argued to be a part of smart city developments. Similarly, it clashes fundamentally with the Chinese model, in which dataveillance – i.e. "the systematic monitoring of people's actions or communications through the application of information technology" (Clarke, 1988) – practices have been rapidly adopted by the government (Trauth-Goik, 2019). Yet, smart city developments are popular in our Finnish setting, as many Finnish cities, including Helsinki, Espoo, Oulu, and Tampere are claiming to be "smart" (Erkkilä, 2014; Hielkema and Hongisto, 2013; Vallance, 2016; Ylipulli 2015). The dynamic between smart city agenda and the Nordic context should certainly be explored in detail.

3.2 Nordic welfare cities turning to digitalization

Overall, the Nordics are well-known for their welfare state model in which the state has a strong role in protecting its citizens' economic and social wellbeing through a network of social institutions (e.g. Kvist and Fritzell, 2011). Based on a number of typologies from different authors, Greve (2007, 45) summarizes the Nordic model as follows: *Extremely decentralised and at the same time complex structure regarding both regulations as well as financing; High degree of equality; Active labour market policy with high level of employment (also for women) and low level of wage differentiation; High level of taxes; Family friendly in the sense that the public sector has been actively involved in delivery of day care for children, leaves schemes for parents and a high level compared to other welfare states of economic support for families with children.* Further, Greve (ibid.) adds that the Nordic model has also been described as a 'service welfare state' because of the importance of public service delivery including social care (children and elderly) and health care. Welfare state models exist globally but they have significant structural and institutional differences, boiling down to differing dominant ideologies as suggested by Esping-Andersen's typology (1990) (see also Anders & Heien, 2001). The author describes 'three worlds of welfare capitalism': The *liberal*, the *conservative* and the *social democratic*.

Briefly explained, the *liberal regime* includes Anglo-Saxon welfare states, referring to the United States, Canada and Australia, for example. In these states the distribution of resources is mainly

controlled by the market. Welfare provisions are targeted only to those who have proven need, and the level of social insurance programmes is modest. The logic of stratification is characterized by social dualism between affluent citizens and those who receive social assistance – and are often stigmatized. (see also Heien & Hofäcker, 1999). The *conservative regime* applies to many Continental European countries, such as France or Germany. As Anders & Heien (2001, 342) describe: *Although the level of state activity is clearly higher than in the liberal type, it is restricted to situations where the family fails to ensure social security. – Welfare provisions depend on work performance with respect to previous earnings – Therefore, protection against market forces depends primarily on labour-market position, with (male) employees and their families being de-commodified to high degree and others being insufficiently de-commodified.* This results in a rather strict hierarchical segmentation. Lastly, we arrive at the *social democratic regime*, smallest of the three and typical for the Nordic countries. These countries are characterized by the aim of strongly promoting equality by arrangements that ensure that income is transferred from those better off to worse off. Instead of the market, the state has a strong role in the distribution of resources and citizens are granted universal benefits; due to this, dualism or segmentation are not central facets of the society. Access to welfare is an individual right. (Anders & Heien, 2001, 341-342; Esping-Andersen, 1990.) In recent years, the Nordic model has been under serious pressure and its principles have been challenged especially by neoliberal thinking, but so far, it has mostly retained its foothold in Northern European societies (e.g. Kamali and Jönsson, 2018).

Although having many similarities between them in global comparison, the Nordic countries have implemented the Nordic model in differing ways. In Finland, the cities (municipalities) have especially central role. This is rather unique and differs from the other Nordics as well, as described by Moisio et al. (2010, 1): *The most obvious difference is that in Finland public administration is6igitalizsed by only two tiers of government, the central government and the municipalities, whereas in Sweden, Norway and Denmark the local government consist of municipalities and intermediate government level*. In practice, this means that Finnish Cities as organizations bear a heavy task: they are responsible for arranging a broad spectrum of public services for citizens, including all health and welfare services and all education services except university level education. In addition to these main services, municipalities run or organize together with joint authorities a wide variety of other tasks, such as planning services, cultural, environmental, and leisure services. This results in that the Cities' overall economic importance is high, and they are major employers: in 2010, municipality spending as a share of GDP was 18 % and municipalities employed approximately 20 % of the total Finnish workforce (Moisio et al., 2010, 1). The municipalities can organize themselves rather freely, but the two studied Cities, Helsinki and Espoo, bear many similarities in their organization: they consist of large divisions, which are ruled primarily by the City Council. In Espoo the main divisions are Education and Cultural Services, Social and Health Services as well as Environment and Technical Services (City of Espoo, 2019a), and in Helsinki the Education Division, the Urban Environment Division, the Culture and Leisure Division and the Social Services and Health Care Division (City of Helsinki, 2019a).

The need to arrange public services with less money for a larger population is one of the key reasons why Cities all around the globe are embracing smart city agenda and urban digitalization (e.g. Cardullo & Kitchin, 2019). Finland is no exception; as in many post-industrial societies globally, the

rapidly ageing population is putting a lot of strain on public services and therefore, on public finance. Further, both the flows of domestic migration and immigration are headed towards the metropolitan region, which diversifies and increases the population of the area.

4 Analysis

4.1. Shedding light on cities' digitalization strategies and smart city practices

In this chapter, we highlight the key parts of Helsinki's and Espoo's strategies that emphasize digitalization, and give a brief introduction to the Cities' smart city activities. The *general strategy of Helsinki* boldly states that the city intends to become "the most functional city in the world", that also "makes the best use of digitalization" and will be "the world's leading city in opening up and utilizing public data" – just to highlight some of the technology-related arguments embedded in the document (City of Helsinki, 2019b). In addition to the general City strategy underlining centrality of digitalization, Helsinki has a specific *digitalization strategy* that came into effect in 2019; further, also the differing divisions of the City of Helsinki have produced their own *digitalization programmes*. The digitalization of the capital city is not just words: on the operational level, the City has hired – based on the initiative put forth by the Mayor – a *chief digital officer* (2018-), established an *operating committee of digitalization* and an *office in charge of digital transformation*. At the time of writing this article, they had also just hired a *head of data* and were finalizing a new data strategy.

On the other hand, the approach in the City of Espoo is curiously different: their general strategy is called *Espoo Story*, which intends to act as a common narrative for all the divisions as well (City of Espoo, 2017a). As stated by one of the interviewees, they have intentionally wanted to focus on only one strategy (E1). Probably the most important single statement in the strategy concerning digitalization is as follows: "The needs and wishes of residents concerning our services will become more diverse. Espoo will act as a pioneer in the development of services and the utilisation of digitalisation and robotisation. The City as a Service model will be used to respond to increasing and diversifying service needs in a resident and customer-oriented way, cost-effectively and with high quality. This new way to organise services will utilise existing facilities and other resources in a networked manner, enabled by digitalisation." (City of Espoo, 2017a, 4.) At operational level, Espoo does not have one singular unit that would be in charge of digitalization – which is a clear difference compared to Helsinki. They are executing digitalization through practices that cross over conventional borders of units and divisions. Espoo has employed a *development manager* who is in charge of the "digital agenda 2.0", finalized already in 2016. The central tool for operationalizing digitalization in Espoo is a *programme of digital agenda experiments*, in which the City is testing and developing digital solutions in collaboration with companies and research partners. Described briefly, within the programme different novel technologies and digital services are explored in different real environments which the City can grant access to, such as schools, day care and health services.

Curiously, the term "smart city" is not mentioned even once in the general strategies of the studied Cities. The strategy of the City of Helsinki only mentions "smart traffic solutions", "smart mobility solutions" and a "smart school" which refers to a pedagogical concept. Overall, the smart city

development that both Cities are *de facto* executing seems somewhat detached from urban digitalization depicted in the previous paragraphs. This separation is discussed further in the next Chapter based on the expert views expressed in the interviews; here we aim to briefly describe how smart city actions are organized and carried out in practice in Helsinki and Espoo.

The City of Helsinki has organized its smart city development through an innovation company *Forum Virium Helsinki*, a subsidiary of the City of Helsinki group, established already in 2005. It is a cluster of diverse actors, as stated in the web pages: "It co-creates urban futures with companies, universities, other public sector organizations and Helsinki residents." Additionally, in line with the general strategy of the City, "Forum Virium Helsinki's mission is to make Helsinki the most functional *smart city* in the world" (Forum Virium, 2020a, emphasis by authors). At the time of writing this article Forum Virium is focusing especially on developing and carrying out agile piloting in a city district called *Smart Kalasatama*. The area used to be a container harbor which is being re-developed into a new living and working environment, providing housing for 25.000 people and 10.000 jobs. (Smart Kalasatama, 2020.) The project has gained a lot of visibility abroad, and Helsinki is usually ranked high in global smart city rankings; for example, in *Eden Strategy Institute's ranking 2019*, Helsinki was considered the fifth best smart city in the world (Forum Virium, 2020b).

The City of Espoo, on the other hand, has not organized its smart city development through a similar singular city unit as Helsinki. Nevertheless, it has a cross-administrative development programme called *Sustainable Espoo,* which is focusing on building a smart city area in the near future at one specific site. The area is called *Kera,* currently mainly a rather bleak-looking industrial district, lacking everyday services. Nevertheless, it is located along the urban railroad and quite close to the city centers of both Espoo and Helsinki which makes it an attractive site for urban renewal. "The new, urban Kera will be one of the first places along the urban rails where the *smart city of the future* will be built. The City of Espoo's objectives of permanently becoming the most sustainable city in Europe and achieving carbon-neutrality during the 2020s will be taken into account in Kera's development." (The City of Espoo, 2019b., emphasis by authors.) The area is planned to offer a living environment for 14.000 and jobs for 10.000 people.

4.2 Focal points of urban digitalization: data, AI and proactive services

In the following we depict urban digitalization and smart city development of Helsinki and Espoo as they were perceived by our interviewees. Helsinki has launched its digitalization programme relatively recently and most of the actions related to its execution have been implemented during the last two years, as described in the previous Chapter. The City has been putting a significant amount of resources and effort in strategy work and management, and hired several experts to lead and carry on the digitalization in practice. The six interviewed experts working for the City had a uniform perception of what constitutes the core of Helsinki's digitalization: *data*. The digitalization was described as being founded on data: how the City can learn from data and utilize it in service production and decision-making. The interviewees perceived that the goal was to serve different kinds of people more *proactively* and offer them personalized services; this was deemed as a great paradigmatic change (H1). They explained that for example, health care services would be offered

proactively to those who are noticed to belong to a certain risk group. In order to process data, adaptive algorithms or *AI* is needed, as the interviewees stressed, and Helsinki is currently investing in exploring these technologies in urban context.

Espoo, on the other hand, is a smaller city and organization than Helsinki and its investments in digitalization have not been as impressive as in the capital city. However, Espoo has carried out its "digital agenda experiments" programme since 2016, and in some areas, they have accomplished more in practice than Helsinki. The City has, for example, carried out a significant AI experimentation in collaboration with companies: large data sets collected during 14 years by different divisions were combined and analyzed with AI, in order to find factors that contributed to the risk of needing child welfare services. The aim was to study whether the City could, by utilizing big data, predict service needs and act proactively (City of Espoo, 2017b). Despite these achievements, the interviews demonstrated that the core of Espoo's digitalization was not clear to everyone: all the interviewees mentioned "City as a Service" model but did not necessarily know how to define it, and one mentioned "we are wondering here [at the unit] what it exactly means" (E4). Those who knew closely the strategic development work explained that one central vision is that the role of the City is transformed through digitalization: it focuses more on utilizing data, managing data, and managing *with* data; in the future, the City does not need to produce all the public services by itself but it can act as a conductor that orchestrates the service ecosystem. This means, for example, that private companies can offer some services that are based on data provided and administered by the City. Overall, several interviewees discussed that digitalization can be utilized in arranging, producing and guiding services, and in automating some processes. Therefore, *data*, *proactive services* and *AI* were themes that became evident also in the interviews conducted in Espoo.

Overall, in the experts' interviews digitalization of Cities was discussed as something that holds great promises yet also great risks - nevertheless, it was seen as a crucial part of both Cities near future development. The smart city as a concept did not usually come up when interviewees talked about digitalization. However, when asked, everybody was aware of the agenda, and several had first-hand experience of the *Barcelona Smart City Expo* or some other international smart city event. Interestingly, bringing the concept into discussion stirred up very negative comments. Overall, the concept was deemed as vague; nobody anymore knows what it means. The other central critique, repeated by almost everyone, was that it is too focused on technologies, infrastructure and especially on sensors – and data collected with those sensors, including tendencies of "naive" solutionism. One interviewee commented that this is "Not the complete picture of smartness" (E1). The experts' recurrent argument was that the urban citizens must be put at the center of the techno-urban development; their everyday actions and life, and on the other hand, technological skills must be the starting point of any agenda – and SC does not fulfill this prerequisite. Further, the ownership of data collected through the smart city technology, potentially owned by a third party, was considered as a central challenge; the interviews emphasized the citizens' trust for authorities and on the other hand, data security, should not be compromised. Few experts also mentioned directly that they see very problematic that smart city solutions are promoted and developed by non-democratic countries; they brought up undemocratizing tendencies, such as those connected to surveillance, and they felt 'we' [urban developers, politicians in Finland] should be more critical towards these strands of development. Only three of the interviewees (H3, E3, E4) had neutral or even slightly positive

perception of the smart city agenda. However, they also stressed the agenda's content in Finnish context should be defined extremely carefully; in other words, it should be localized to match the urban strategies, societal values and physical conditions, such as sparsely populated urban areas. One expert also pondered that SC agenda's relationship with urban digitalization should be discussed more. To summarize, we can interpret the interviewees saw urban digitalization – as it is envisioned and executed in Helsinki and Espoo – more citizen-centric approach and better suited to Nordic society than the smart city agenda.

4.3 Data-rich cities

In this next chapter, we aim to describe how our interviewees saw the context-specific dimensions of urban digitalization connected especially to data which was clearly deemed as one of the central themes. We cannot untangle the complex relationship between urban digitalization and smart city development without paying attention to specific historical and sociopolitical development strands of Finnish cities that have shaped their relationship with data. As also a few interviewees stressed (H5, E5), due to the long tradition of collecting citizen data and the Cities' focal role in service production, explained in more detail in the Chapter 3.2, Cities hold immense amounts of valuable data of their inhabitants. According to Statistics Finland (2011), "In Finland the earliest uses of administrative data can be traced back to census collections in the eighteenth century," and also that the country is "among the world pioneers in the statistical use of administrative data sources". These include long-term data sets from all the sectors managed by Cities, from day care to schools, from health care to leisure activities. Increasingly, this data is digital as services and infrastructures of the city have been digitalized. Further, it is versatile and includes also spatial data collected through infrastructures and sensors which is at least partially very similar with what is understood often as "smart city data": Cities hold data, for example, of people's movement patterns which has been gained through digitalized public transport system (HSL, 2020). As depicted above, the Cities had already been experimenting with some parts of the data by analyzing it with the help of AI. This results that compared to cities in other countries that are not in charge of such a heavy load of public services, Finnish cities can be considered as *data-rich cities*. This can explain why the smart city agenda was seen negatively by many Finnish experts, and even as something useless: data-rich cities do not necessarily need expensive data-harvesting infrastructures offered by big companies. They already have valuable data that covers almost every aspect of urban inhabitants' lives, which, at least in theory, can open up deep and broad insights into urban reality, its past and future.

Naturally, urban digitalization as defined in this article entails great legal and technical challenges, starting from limitations posed by GDPR (General Data Protection Regulation of European Union, which came into effect in 2016) to the fragmented nature of Cities' data and incompatibility of the databases. Several interviewees also saw the lack of expertise as a central challenge: to effectively utilize digital data and AI, the City organizations would need to establish a number of new positions or complete teams. Another option is to collaborate extensively with companies – as Espoo had already done when executing its AI experimentation explained in previous chapter. Interestingly, the interviewees deemed an aspect that can be considered as a sociocultural challenge as the most crucial prerequisite for the success of urban digitalization, namely *the urban citizen's trust for data*. This was

evident especially in interviews conducted in Helsinki, but the theme was also mentioned by every interviewee of the City of Espoo. The concept of trust is closely connected to the Nordic welfare state model (e.g. Brandt and Svendsen, 2010). A recent research report summarizes: *It is difficult to imagine societal models like those in the Nordic countries if citizens do not trust that other citizens also contribute to the economy through the tax system, and that public authorities manage tax revenues in a fair and efficient way, free from corruption* (Andreasson, 2017).

Also, people in Finnish have generally high trust in authorities (Bäck and Kestilä, 2008; Lawson et al., 2010). The expert interviews and Cities' strategies seem to contain an idea that only by maintaining and cultivating this trust also in regards to data, the Cities can utilize the data sets they hold in new ways. Cities did not seem eager to give up on the ownership of the data to third parties; it was mentioned by some of the interviewees (H2, E3) that in specific projects, they had made decisions not to handle the ownership of citizen data to private sector actors (which had also lead to turning down some collaboration proposals by big companies). Thus, in addition that Finnish Cities do not necessarily need data infrastructures provided by corporations, the interviewees also stressed they do not want to compromise residents' trust for data. Therefore, the citizen-centric approach to digitalization entails recognizing that digitalization should serve residents without violating their rights for their own data.

One of the strategic objectives of the Helsinki's digitalization programme is that "Residents can have their say on how their data is used" (City of Helsinki, 2020). This means that everybody can find out what kind of personal data has been collected about them, and have a say on how the City utilizes this data. The strategy has also been put into practice as our interviewees told: Helsinki has been exploring through experiments, pilots and events targeted to general public its possibility to take the role of a "MyData" operator that would enable people's personal data management (on MyData, see Poikola et al., 2015). In Espoo, trust for data and individual residents' personal data management was discussed by interviewees especially in relation to the City's AI experimentation. One interviewee explained they had been exploring, for example, a possibility that the City would produce a platform that shows and explains to every resident how their data is processed by AI; they had also been creating an operational model about how to inform residents about the use of AI in city services (E5). To what extent residents can deny the use of their data was not yet clear as the operational models and principles were just taking shape. However, we can interpret that *openness* and *freedom of choice* were among the central principles of Cities' data management.

5 Results and discussion

As presented in previous chapters, the relationship between the studied cities' digitalization programmes and smart city programmes was complex. On the surface, both can be seen as urban development agendas that aim to increase the role of digital technologies in cities in order to provide better services and more sustainable life with lesser costs; at the same time, they open up new opportunities for companies to act as allies and service providers in collaboration with the Cities. Data is increasingly seen as the core of such developments; through elaborate analyses of the data on cities and citizens, authorities can learn from data, orchestrate processes and provide proactive services. However, the Nordic societal context and Finnish urban context in particular created friction

resulting that smart city agenda has not been accepted by Cities' authorities without critique; rather, the integration of new technologies and digitalization into cities had given birth to separate digitalization strategies, that seemed somewhat detached from the ongoing SC projects taking place in the same cities. While the SC agenda is a form of urban digitalization, urban digitalization does not necessarily work according to the SC agenda. Rather, urban digitalization must be seen as a broader concept. Indeed, for our interviewees, it was perhaps also seen as a less loaded term politically – one that enabled them to think about digital technologies within the context of their Finnish cities.

These findings are in agreement with the theoretical literature we explored at the outset of this article. Our study was informed by an awareness of the push created by the informating capabilities of digital technologies and its subsequent commodification. These developments render it possible to align the digitalization of cities closely with neo-liberal policies to the point that the SC agenda can be described as a mode of neoliberal urban planning (Cardull and Kitchin, 2019; Zuboff, 2019). These realities were present as a kind of an uneasy relationship between our Finnish city officials and the SC agenda. Combining this literature with our findings, we argue that digitalization, should be seen as an umbrella term, while SC could be seen as a more politically pre-defined subcategory of urban digitalization. However, we must point out that not mentioning the political context or landscape in conjunction with a digitalization initiative does not mean that there is none behind it; rather, urban developers should openly reflect and consider their cities' historical and political traditions, especially towards citizenship, rights, transparency, ethics and democracy.

Furthermore, we noted that Finnish cities have had a unique role in the society as central providers of a broad variety of public services; in addition, there exists a long tradition of collecting citizen data in Finland. Finnish urban data differs from what is often considered to be urban data; it consists not only of sensor data and infrastructure data, such as cash registers and public transport– it touches on all aspects of Finnish lives, from cradle to grave. This is our rationale for calling Finnish cities 'data-rich', and this is what makes it crucial to treat this data democratically. The global smart city development, on the other hand, is focusing more and more on turning cities into massive Internet of Things platforms that produce continuous flows of data about citizens and processes of the city. Finnish Cities can, in some sense, confidently overlook this development as they already are sitting on top of data masses that can provide very in-depth insight into everyday life of their residents. However, as the studied Cities are, at the same time, building districts that are labeled as "smart", they could greatly benefit from producing and spreading localized smart city definitions that resonate with digitalization and support it aims in democratic ways. Our interviewees were convinced that the city data that they were in control of should be utilized for welfare purposes; on this premise, we must here call for development of a critical-pragmatic Nordic style of urban digitalization built on a foundation of the democratic welfare model. Citizen data has been a part of the Nordic model for hundreds of years, suggesting that data collection does not necessarily have to lead to undemocratic actions. However, new ways of using the data, especially artificial intelligence, presents an enormous challenge to policy makers and private citizens.

Accordingly, the data-richness combined with human-centric approaches and more general Nordic democracy, has resulted in that Cities are currently considering carefully how they can use these data sets ethically and in partnership with the citizens. Finnish model of urban digitalization is largely

based on creating services for people based on people's data; a prerequisite for this was, according to the interviewees, people's trust for data and authorities. When writing this article, cities are exploring, piloting and also negotiating with citizens how they could promote openness in their data management and use, and how to operationalize the data rights of the residents – for example, how people could see what personal data is used and for what purposes, and how they could give permission or deny the use of their data.

Naturally, this development is not straightforward or easy, and for example residents' digital skills come here into play: in order to manage one's own data, the individual must first realize s/he owns data that can be used for different kinds of purposes. Digital equality and Cities' role in enhancing digital citizenship skills were also discussed with the interviewed City experts, but analyzing these further falls out of the scope of this article. Here we arrive into the limitations: our research data contain many strands that we will analyze further in other articles. However, the central nature of urban data needs also more attention, and in the future, we deem it important to approach data from other perspectives as well: How, for example, the other central stakeholders, the urban citizens, see the data. The broader objective of this article has been to demonstrate the importance of analyzing smart city agenda within different contexts; we argue our analysis reveals the complexities that arise when global agenda meets local practices, processes and parameters.

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