Article

Urban Studies

Who is the 'smart' resident in the digital age? The varied profiles of users and non-users in the contemporary city

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Abstract

This paper is centred on the levels of participation in digital municipal platforms, and its goals are threefold: (1) to assess the normative aspirations and limitations of policy makers and key actors in the municipality with regard to the smart resident idea, with a focus on participation and privacy; (2) to assess and categorise levels of participation in varied social and geographic contexts in the city; and (3) to assess the possible link between participation and privacy practices among users. Empirically, this paper studies the practices of the inhabitants of Tel Aviv-Yafo City, with a focus on the use of digitised services provided by the municipality and the use of the celebrated project 'Digi-Tel' – a digital card that offers to the inhabitants of the city services, discounts, targeted information and benefits around the city. The assessment of the inhabitants' practices is based on a survey that was conducted in four neighbourhoods with different socio-economic, ethnic and geographical characteristics. The survey is supplemented with interviews of prominent figures in the Tel Aviv-Yafo municipality to understand their views on participation and privacy. The paper concludes with a discussion of the varied profiles of the users and non-users of digital platforms in the city, revealing their complex approach to participation in the digital age.

Keywords

digital age, neighbourhoods, networks, technology, smart resident, smart cities

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摘要

本文主要探讨数字城市平台的参与水平，其目标有三个：(1)评估城市决策者和关键行为者对智能家居理念的规范愿望和限制，重点是参与和隐私；(2)对各种城市社会和地理环境下的参与程度进行评估和分类；以及(3)评估用户参与和隐私实践之间的可能联系。本文对特拉维夫市居民的做法进行实证研究，重点是研究该市提供的数字化服务和著名的"Digi-Tel"项目的使用情况。"Digi-Te"是向城市居民提供城市服务、折扣、有针对性的信息和福利的数字卡。对居民做法的评估基于在具有不同社会经济、种族和地理特征的四个街区进行的调查。调查还辅以对特拉维夫市知名人士的采访，以了解他们对参与和隐私的看法。本文最后讨论了特拉维夫市数字平台用户和非用户的各种概况，揭示了他们参与数字时代的复杂方法。

关键词

数字时代、街区、网络、技术、智能居民、智能城市

In recent years, the smart city paradigm has gained traction in urban studies and urban policy. A key component of the idea of the smart city is the development of a digital infrastructure that enables the development of information processes (gathering and distribution) in the physical space of a city (Barns et al., 2017). Underlying the smart city discourse is the techno-utopian belief that the use of information and communication technologies (ICTs) is imperative to confront the challenges of urbanisation and sustainable development (Buck and While, 2015; Datta, 2015; Gabrys, 2014; Townsend, 2014; Watson, 2015; Wiig, 2015). At the heart of smart cities are cyber systems that collect ever-increasing amounts of data from various sources and use them to improve planning, upgrade infrastructures, and track and enhance city operations to offer better services at lower costs.

Socially, although smart cities focus on technological innovation and economic growth, scholars have also pointed to the cultivation of the smart resident (Calzada, 2018; Holland, 2008), that is, the user of digital municipal platforms. Municipal digital platforms, a top-down initiative, aim to support civil participation and are based on the following two linked assumptions: (1) residents who fully embrace digital assemblages of hardware, software and networks are empowered to communicate, collaborate and participate in urban governance processes and mechanisms (Ho, 2016); and (2) by leveraging digital conduits, information is shared easily and quickly, and urban services can be delivered more efficiently and in new ways (Spinak and Casalegno, 2012). Thus, smart residents are considered to be active inhabitants who participate in and respond to city affairs, are technologically oriented, and are able to use and understand ICTs (Hatuka et al., 2018; Holland, 2008). However, this idea is a top-down vision (Calzada and Cobo, 2015) that often transforms residents (not by choice) into 'sensing nodes – or citizen sensors' (Gabrys, 2014: 32). Indeed, as scholars argue, the choice to go offline or unplug from the endless flow of data, or to be smartly connected and critically use digital technologies, becomes a nearly unreasonable option that very few individuals make (Calzada and Cobo, 2015: 14).

Thus, the idea of the smart resident, and particularly its participatory dimension, can be viewed as a bi-directional contested political concept. On the one hand, it provides

the resident with tools to participate in the local or central affairs of his or her municipality. On the other hand, it provides the municipality with (intrusive) tools to respond to and engage with its residents. The smart resident idea has been highly criticised by scholars, who have argued that it enhances a digital divide that deepens the disadvantages of already socially disadvantaged residents (Calzada and Cobo, 2015; Nam and Sayogo, 2011). Importantly, the digital divide is no longer defined simply as a difference in physical access to the internet (DiMaggio, et al., 2004; Gunkel, 2003; Robinson et al., 2015; van Dijk, 2006) but rather as a complex, dynamic category of analysis influenced by constant changes in technology. Furthermore, the contemporary literature has linked digital divides to digital inequality; the basic level of exclusion is related to accessibility, while higher levels of exclusion stem from gaps in capabilities, skills, participation, motivation, types of internet usage and social support (van Dijk, 2006). The basic level of exclusion, the 'poverty of connections', as argued by Stephan Graham and Simon Marvin (2001: 288), 'limits a person's or a group's ability to extend their influence in time and space, often condemning them to local, place-based ties and relationships'. Other studies have also addressed digital divides and suggested that these divides aggregate, such as by 'charting the interaction of two variables – access to the Internet and socio-spatial inequality' (Crang et al., 2006: 2551). Generally, many of the theoretical and empirical studies of digital divides have offered a normative conclusion that 'urban digital divides' influence participation practices and access to resources and should be ameliorated via progressive and innovative policy initiatives that aim to bridge the gaps between social groups in the city.

Both supporters of the smart resident idea, who celebrate its participatory ethos, and critical scholars, who emphasise how digitisation deepens inequality, share the same underlying premise: that ICTs are essential to daily practices in contemporary cities. Responding to this ethos, many existing studies have focused on analysis of digitisation processes in cities, paying attention to the agendas of particular corporate players or municipal policy perspectives. Most studies of digital participation have been conducted at the national level and have primarily been based on data obtained from national random-sample surveys (Bélanger and Carter, 2009; McNeal et al., 2008; Mossberger et al., 2003; Nam and Sayogo, 2011), or they have been studies at the local level, typically based on samples of representatives of local authorities (Kolsaker and Lee-Kelley, 2008; Lee-Kelley and James, 2003). This paper represents a departure from the many existing studies, which have focused on digitisation processes in cities, and suggests studying the varied profiles of digital users in the city. The key questions are as follows: Who are the contemporary residents of the city who use municipal digital platforms? What are their profiles? What influences their digital use? The key argument of this paper is that the profile of the smart resident is not unified and that a lack of participation does not necessarily imply a digital divide or digital illiteracy but should be viewed within a wider spectrum of parameters and choices, especially with the growing public consciousness regarding privacy, which might be further enhanced with the General Data Protection Regulation (GDPR) initiative in the EU (2016/679; Hoofnagle et al., 2018).

Following this point of departure, the general goal of this study is to understand the varied profiles of users and non-users of digital platforms in the city by going beyond the perception that non-users are necessarily disadvantaged residents. This approach suggests addressing the cultivation of smart residents as a political project that 'recasts who

or what counts as a "citizen" and attends to the ways in which citizenship is articulated environmentally through the distribution and feedback of monitoring and urban data practices' (Gabrys, 2014: 32). More specifically, this paper is focused on the levels of participation in digital municipal platforms, and its goals are threefold: (1) to assess the normative aspirations (and limitations) of policy makers and key actors in the municipality with regard to the smart resident idea, with a focus on participation and privacy; (2) to assess and categorise levels of participation in varied social and geographic contexts in the city; and (3) to assess the possible link between participation and privacy practices among users.

Empirically, this paper studies the digital practices of the residents of Tel Aviv-Yafo. It focuses on the use of digitised services provided by the municipality and the use of the celebrated project Digi-Tel, a digital card that offers residents services, information and benefits throughout the city. The assessment of residents' practices is based on a survey ($n = 490$) conducted in four neighbourhoods with different socio-economic, ethnic and geographic characteristics. The survey is supplemented by interviews with prominent figures in the Tel Aviv-Yafo municipality, with a focus on participation and privacy concerns.

The paper has four sections. The first briefly reviews the academic discourse on the smart resident idea, with a focus on two interlinked debates often presented separately, that is, participation and privacy. The second section introduces the case study and the methods used in assessing the case. The third presents statements by key stakeholders on the city council regarding the smart resident idea and the survey results, with a focus on users and privacy. The paper concludes with a discussion of the varied profiles of the users and non-users of smart municipal platforms, revealing their complex approaches to digitisation.

The smart resident: Reviewing and linking the discourse on participation with the discourse on privacy

The concept of a smart city, which involves using ICTs to craft new forms of human interaction and to render decision-making processes more open (Meijer and Bolívar, 2016), has evolved over the years. In the 1990s, smart cities were viewed as a project that could enhance democracy by improving representative participation in political decision making, strengthening democratic institutions and processes, and involving the public in political choices to accommodate residents' needs and priorities (Council of Europe, 2007, in Kolsaker and Lee-Kelley, 2008). This ambitious, and, to a certain extent, utopian goal has been re-evaluated by scholars, who have pointed to the challenges and dark sides of contemporary relations between residents and local government (Kolsaker and Lee-Kelley, 2008; Morozov, 2011). In the city in the digital age, being unplugged is almost unthinkable if one wishes to become part of the city's life and dynamics. However, the result is that everyone is 'plugged in as passive mass users, while the data control centre decides what to do with the information' (Calzada and Cobo, 2015: 19).

To be sure, the digitisation of cities itself is not the problem; indeed, it could be an enhancement of what humans can do together. It is what accompanies digitisation, particularly its infrastructure of surveillance, that represents a risk (Couldry, 2017: 182–183). Critical scholars have focused on the surveillance practices that accompany digitisation and have seen them as an external intrusion – as a state in which the individual is constantly visible to authorities, thus reducing privacy (Dodge and Kitchin, 2005; Graham, 1998, 2002; Graham and Wood, 2003; Haggerty and Ericson, 2000). This

condition of visibility, specifically with location-aware technologies, has become constant (Hatuka and Toch, 2017). Furthermore, this condition, in which users' personal data are constantly being collected and can be used by third parties, enhances user vulnerability (Birnhack, 2008). As such, citizens pay an intangible price for their digital activity and smart participation, including sacrificing their privacy, information security and freedom of choice (Morozov, 2013). As has been argued, digitisation processes and algorithms adjudicate increasingly consequential decisions in our lives (Kitchin, 2017) and we, as a public, lack clarity 'about how algorithms exercise their power over us' (Kitchin, 2017: 15). In that sense, algorithms become the power that reshapes how social and economic systems work (Kitchin, 2017: 6).

This condition of enhanced processes of digitisation and the intangible price that citizens pay for it are manifested in two prominent (not always considered to be related) debates: participation and privacy.

Participation: What does it mean to be a smart resident?

The smart resident is an active inhabitant who participates and responds to daily affairs in the city using his or her ICT skills to communicate his or her desires. This definition, which IT companies sell and policy makers tend to adopt, is a contested issue. The contestation focuses on who profits and the benefits from the decision to pursue smart city policies (Shkabatur, 2011). Residents might engage one another or the public through their use of crowd-sourcing platforms, feedback-reliant applications and online public forums (e.g. Twitter, Facebook, and VKontakte). Thus, while traditional cultures saw information shared horizontally among citizens, the new urban landscape is marked by 'a dramatic shift to

vertical information sharing between citizens and government' (Finch and Tene, 2014: 1593). However, it has been argued that engagement with these platforms does not necessarily embody meaningful participation in a democratic system (Morozov, 2011, 2013). Rather, the use of these technologies blurs the line between participation in public life and consumption. Moreover, even if this type of engagement is accepted as a form of participation, it is not broadly based. In a technologically advanced, networked city, the voices of the digitally connected are the loudest. Thus, residents without access to the internet or smart mobile devices are unable to either participate or consume.

Business interests and the competitiveness of the city play key roles in the envisioning and implementation of digital participation. Scholars have argued that the strongest advocates for technologically advanced and networked cities are large ICT firms (e.g. IBM, Microsoft, Cisco) that desire ever-increasing profits, or city officials who aim to increase their cities' competitiveness relative to that of other cities either by providing technological amenities (e.g. free wireless hotspots) or through marketing (Calzada and Cobo, 2015; Hollands, 2008; Wiig, 2015). These arguments expose the civic conundrum of ICTs, which, on the one hand, support and improve the quality of daily life but, on the other hand, transform all people into willing sensors (Elmaghraby and Losavio, 2014; Martinez-Balleste et al., 2013; Steenbruggen et al., 2015). Furthermore, it can be argued that smart participation is caught between these two polarised orientations, which operate in opposite directions simultaneously. On the one hand, as the backbone of the cyber city, ICTs have transformative potential for democratic governance, with residents engaging one another or the public through online public forums. On the other hand, the neoliberal ideology and the privatised, consumerist-driven vision

of the city suggest that the existence of ICTs does not always translate into meaningful civic engagement and participation (Shkabatur, 2011).

Privacy: What is the price of being a smart resident?

Technologies enable municipalities and private firms to record and track citizens' activities for varying purposes (Calzada and Cobo, 2015: 30). Recording daily life in seemingly ever-increasing detail is not without social and personal consequences (Klauser et al., 2014). A person's location at a given time can reveal personal information to which neither the government nor the public has a right. If collected over a number of months or years, these data can reveal personal life patterns, which are also private. This superficially innocuous surveillance challenges the entire notion of a 'private life'. The storage of residents' data, from their location to their debit and credit card information, can compromise their privacy and the security of their personal information (Elmaghraby and Losavio, 2014; Martinez-Balleste et al., 2013; Seto, 2015). Companies can use information about customers' behaviour to improve their services, to nudge consumers' behaviour in such a manner as to conserve a scarce resource (e.g. water in regions prone to drought), or to increase profits. Finally, 'there is a growing interest in using telecom data for crowd management and anomaly detection' (Steenbruggen et al., 2015: 341). City, regional and national governments can use call data records and applications that identify users' locations (e.g. Twitter) to estimate the number of people at a particular place and allocate resources proportionally. This information can help cities to provide better emergency aid or, alternatively, to suppress residents or citizens. Thus, participatory sensing can

simultaneously be viewed as 'an emerging form of mass data collection and [...] therefore an alternative form of surveillance' (Shilton, 2010: 132). As argued by Igor Calzada (2017: 13), 'The availability of data is and will be part of the new conditions in cities. However, unpacking the ownership of data and its governance structure and dynamics within their citizenries will be as important as the collection, storage, and usage of data in cities and regions.' The techno-politics of data is one of the most serious challenges of smart residency (Popescul and Radu, 2016; van Zoonen, 2016) because technological ecosystem powering is complex; it is a data environment that is 'at once centralized and de-centralized, with private businesses operating data centres and infrastructure and offering apps and services on account, and sometimes in lieu, of local government entities' (Finch and Tene, 2014: 1593).

The debates on participation point to a dramatic shift in the way the idea of residency in cities is conceptualised and managed. The underlying assumption of municipalities is that digital participation will be embraced by residents who have access to it. However, as argued in this paper, residents are not one entity, and participation today should be viewed in the context of the management of privacy by both the resident and the institutional power. This departure point offers a different conceptual approach to study the participation of residents in the digital age. It is suggested that differences in the levels of participation should be conceptualised in the context of privacy and other contextual parameters that might affect it. The novelty of this framework is that it (1) juxtaposes the idea of participation and skills with users' awareness of issues around privacy and information security; and (2) assesses these dimensions by targeting varied geographics in the city.
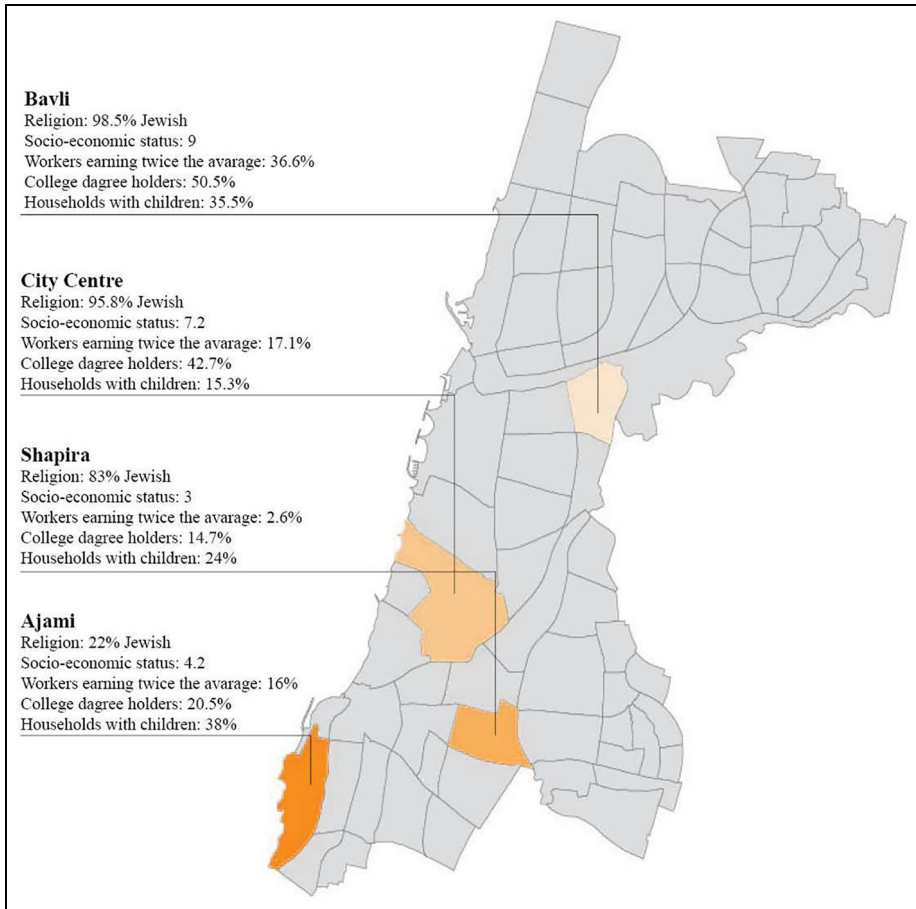
Empirical context and methodology

The digital use of varied platforms by Israelis is relatively high, with 91.5% of the Jewish population and approximately 84.8% of the Arab population online (Israel Internet Association, 2017). Studies have shown that ethnic differences influence internet use among the Jewish and Arab populations in Israel (Mesch and Talmud, 2011), and digital gaps exist among the varied groups in Israeli society. However, these gaps are gradually narrowing and, in general, trends indicate an increase in the use of digital platforms for various uses, including writing e-mails, making payments, engaging in social interactions and downloading software.

This study focuses on Tel Aviv-Yafo, which is the financial and cultural centre and the second-largest city in Israel (432,892 residents). The city is also recognised as a global city (ATKearney, 2017) for its role as a leading business centre in the technology, media, design and creative professions. Demographically, the majority of the city's residents (91.2%) are Jewish, 3.4% are Muslim Arabs and 0.8% are Christian Arabs (Central Bureau of Statistics, 2014). In terms of management, the city is divided into nine districts with a general socio-economic division between north and south, in which the northern neighbourhoods are wealthier.

This study examines four different neighbourhoods in the city, as indicated in Figure 1.

(1) Bavli. Bounded by the largest park in the city (Hayarkon Park) and a highway, Bavli is located on the northeast side of the city. Its proximity to the park and the city centre, in addition to its bounded shape and bourgeois atmosphere, make it a mostly upper middle-class neighbourhood. The median age is 37 years, and the neighbourhood is ranked 9th (out of 10) on the city's internal socio-economic index.

(2) City centre. Stretching from the sea to the east, this dense area is characterised by mixed use (commercial, residential and employment). The residents in this area are mostly young adults and students (with a median age of 31 years). It has the highest percentage of residents who rent (67.3%) and it is ranked 7.2 (out of 10) on the city's internal socio-economic index.

(3) Shapira. Located in south Tel Aviv-Yafo, this area borders a highway to the east and the city's Central Station to the north. The neighbourhood is a dense fabric of low-rise houses (one to two storeys) and is considered a socio-economically weak area that attracts migrants and refugees. The population is young, with a median age of 32 years. The majority of the residents are Jewish (83%) and rent (59%), and the area is ranked the lowest (3rd out of 10) on the city's internal socio-economic index.

(4) Ajami. Located in the south of Yafo along the old Palestinian port city, Ajami is a predominantly Arab neighbourhood (80%) near the sea. It comprises mainly private houses, and the median age of residents is 30 years. Only 16% of workers earn twice the average wage in Israel, and 42% earn less than the minimum wage. Ajami used to be the weakest neighbourhood in the city as ranked on the internal socio-economic index; today, it is ranked 4.2 (out of 10).

To assess the digital use of the inhabitants in the neighbourhoods, a telephone survey ($n = 490$) was conducted in Hebrew and Arabic with participants older than 18 years of age. A total of 3450 households were contacted, and the response rate was 25% and equal across the four neighbourhoods of Bavli ($n = 123$), the city centre ($n = 122$), Shapira ($n = 121$)

Bavli
Religion: 98.5% Jewish
Socio-economic status: 9
Workers earning twice the avarage: 36.6%
College dagree holders: 50.5%
Households with children: 35.5%

City Centre
Religion: 95.8% Jewish
Socio-economic status: 7.2
Workers earning twice the avarage: 17.1%
College dagree holders: 42.7%
Households with children: 15.3%

Shapira
Religion: 83% Jewish
Socio-economic status: 3
Workers earning twice the avarage: 2.6%
College dagree holders: 14.7%
Households with children: 24%

Ajami
Religion: 22% Jewish
Socio-economic status: 4.2
Workers earning twice the avarage: 16%
College dagree holders: 20.5%
Households with children: 38%

Figure 1. Tel Aviv-Yafo and the geographical locations of the four neighbourhoods.
Source: Tel Aviv-Yafo Municipality (2014, 2016); illustration by the authors.

and Ajami ($n = 124$). The survey included 44 questions examining the following themes: e-literacy, local e-governance use, digital services use, digital knowledge, privacy and security concerns (10) and demographic questions (17). In addition to the survey, interviews were conducted with strategic leaders of the Tel Aviv-Yafo smart governance project: the Deputy Mayor of Tel Aviv-Yafo, the Chief Knowledge Officer and the Chief Information Officer of Tel Aviv-Yafo Municipality. The interviews focused on the development of the digital platforms in the city and on privacy concerns and data security.

The smart resident: Participation and privacy in the eyes of policy makers

In recent decades, Tel Aviv-Yafo Municipality has expanded the digital services available for the use of its inhabitants. In 2005–2006, the municipality underwent organisational changes in its knowledge management and online services. Cross-organisational cooperation and investment in ICTs and technology supported the development of various services, including online payments (municipal taxes, water, parking tickets, etc.),

building permits, business licences, forms, registration for the education system, complaints and hazard reports, interactive websites, a Geographic Information System (GIS) and other urban applications. Its celebrated digital project, Digi-Tel, was launched in 2013 and won first prize at the Smart City Expo World Congress in Barcelona in 2014. The prize celebrated the ethos of smart urban governance worldwide, and the city received both local and global attention. As stated on the Israel Ministry of Foreign Affairs website, 'In smart Tel Aviv, engagement is a key value in implementing smart city principles, while the goal is to create a city for all its residents and a resident-oriented government' (Israel Ministry of Foreign Affairs, 2014). In the implementation of this project, the scope of participation and the approach to privacy have been defined and declared.

Participation

In general, the municipality's digital project can be considered a set of initiatives with the following two levels of accessibility: (1) services open to all inhabitants and businesses through the Tel Aviv-Yafo website; and (2) services exclusive to Digi-Tel card holders, called the 'City Club'. The first participation level grants access to free Wi-Fi zones throughout the city ($n = 80$) and enables users to conduct transactions online (such as paying/appealing parking tickets, tracking the status of business permits/building permits, registering children for kindergarten, and making online payments). The second participation level, which is accessed through the Digi-Tel card (i.e. a personalised web and mobile communication platform), provides inhabitants with individually tailored, location-specific information and services. Digi-Tel holders receive personalised information via different channels (i.e. e-mails,

text messages and personal accounts). Digi-Tel is designed to send targeted information based on geographic location, areas of interest and life cycle (e.g. reminders for parents to register their children in kindergarten or animal owners to vaccinate their pets), including discounts, information and messages. Although this service is free to residents above the age of 18, it requires registration and agreement with the terms of data collection.

Digi-Tel's declared goal is to enhance public participation (e.g. by approaching inhabitants in a specific neighbourhood and asking them to provide ideas to improve the quality of life in their neighbourhood, providing information on activities that occur in community centres or providing general information about cultural events and services in the city). Additionally, as the Chief Knowledge Officer stated, 'The concept of Digi-Tel is to accompany the resident throughout his life cycle and give him personalized information and services. […] The trick is to know in advance what the inhabitant needs and to adapt the services and the information' (Chief Knowledge Officer, interview 10 August 2016). In terms of participation throughout the city, the municipality confirmed that more registered users are residents in the north of the city, and the gaps are widening: 'The use of Wi-Fi in Tel Aviv is huge; it is something like 90%, but there is still a gap and difficulty in the southern area of the city. As a city, it is not good that there are such gaps,' said the Chief Information Officer (interview, 1 November 2016). Moreover, as the Chief Knowledge Officer declared, 'The digital divide is still at its peak. […] the digital divide exists. We see in the south of the city, for example, much lower percentages of registration for Digi-Tel – much, much lower' (Chief Knowledge Officer, interview, 10 August 2016).

Privacy

In terms of privacy, the Digi-Tel project presents an advanced platform for monitoring people, and its data collection can be shared with third parties. As detailed in the terms of use, 'The Municipality and/or the club (Digi-Tel) will make use of the information in favour of the club to pursue its goals, including through third parties' (Digi-Tel Terms of Use, Tel Aviv-Yafo Municipality, 2014: section 25.2). Furthermore, 'The municipality and/or the club or anyone on their behalf will analyse the data in favour of the club to pursue its goals, including cooperation with third parties, including commercial entities' (Tel Aviv-Yafo Municipality, 2014: section 25.5). In addition, Digi-Tel enhances and promotes a local government–commercial nexus that jeopardises privacy. Although these details are outlined in the terms of use, inhabitants are not able to negotiate the contract or place restrictions on data collection. Moreover, residents are asked to 'allow the municipality and/or the club to use all databases of the municipality and receive information on their behalf from the Civil Registry that is used in favour of the club to realize its goals' (Tel Aviv-Yafo Municipality, 2014: section 25.3).

The municipality is aware of the unique terms of the contract that residents are obliged to sign. As the Deputy Mayor stated, 'The communication with the residents is very unique to Tel Aviv for two reasons. [...] One, it requires something very rare in the world, and it is a complete renunciation of residents' privacy to participate in this idea. The second is the sincere desire of a body such as a municipality to be in direct contact with all the residents' (Deputy Mayor of Tel Aviv-Yafo, 2016). The municipality is aware of the particular conditions created and promises not to abuse the data collected. As the Chief Information Officer said, 'In terms of information security and privacy, we protect them zealously. We do not disclose any information about people. We do not give information to collect more payments. In addition, for every issue, we meet with the attorney general' (Chief Information Officer, interview, 1 November 2016).

In summary, from the municipality's perspective, participation and privacy are interlinked, and technology is viewed as a tool for social change. As declared by the Deputy Mayor,

> Digi-Tel knows where every resident lives. So let us say someone wants to organize a cultural project; he does eight shows, and the eighth performance is free for Digi-Tel. Therefore, Digi-Tel can give free tickets to residents of the south of the city and not to the north of the city, which means that many times, the technology can allow you to address social gaps; it can allow you to make the best distribution or implementation, to execute programmes in a direct way, by sending a direct text message. (Deputy Mayor of Tel Aviv-Yafo, 2016)

Indeed, although the use of digital platforms comes with a price, the municipality perceives digitisation to be liberating and beneficial for inhabitants. How do inhabitants perceive this dynamic? Who is a smart resident in the city of Tel Aviv-Yafo?

The smart resident: Participation and privacy in the eyes of the user

When use and skills within the neighbourhoods are examined, divides become apparent. Although 87% of the survey respondents have a smartphone and use it at least once per day, there is a gap between the neighbourhoods: 79% of respondents in Shapira and 93% of those in the city centre use smartphones (Figure 2). However, despite the gaps, it is clear that, at least materialistically, the majority of the inhabitants have the ability to use digitised platforms. The situation differs when

A: Do you use your smartphone or computer at least once a day? (smartphone use χ²=11.048; df=3; p<.05, computer domestic use χ²=78.753; df=3; p<.05)

B: E-literacy. (Question: Have you ever downloaded an app on your smartphone? (χ²=19.430; df=3; p<.05)

C: When accessing an app with which you are not familiar, which of the following best describes how you would behave? (83.076; df=12; p<.05)
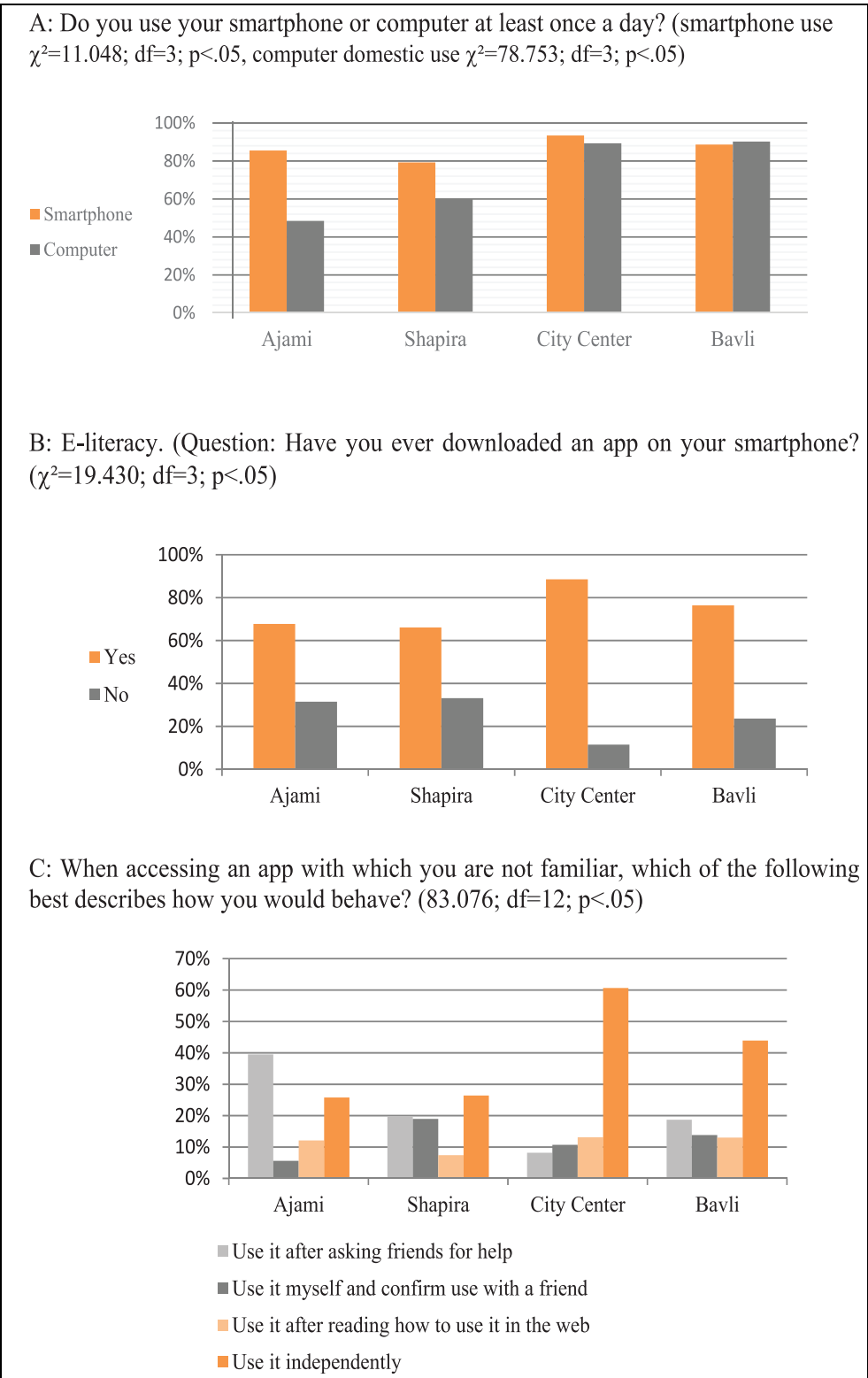
Figure 2. Use and skills.

considering the patterns of domestic computer use across the districts. In the south of the city, in Ajami, approximately 48% of the residents use a home computer once per day; in Shapira, 60% of the inhabitants use a home computer once per day; and in the city centre and Bavli, approximately 90% of the inhabitants use a home computer once per day (Figure 2). The districts also vary in terms of e-literacy: in the city centre, almost 90% of the inhabitants download applications; in Bavli, 76% of the inhabitants download applications; and in the southern neighbourhoods, 66% of the inhabitants download applications. In Ajami, 40% of the inhabitants report that they would contact a friend or relative to learn how to use a new application, and only 26% report that they would use it completely independently, compared with 60% of the city centre inhabitants.

Participation

A key element in understanding the differences among users is tracking their goals in internet use. When the goals of users are evaluated, the neighbourhoods vary significantly (Figure 3). In the southern neighbourhoods, Ajami and Shapira, only approximately half of the inhabitants (46% and 52%, respectively) use the internet for communication purposes, such as e-mail and social networks, whereas in Bavli and the city centre, almost 80% responded that the use of the internet for communication purposes was very important to them. The neighbourhoods are also significantly different in their use of the internet for payments (electricity, water and municipal taxes). In Bavli, 65% said that this use was very important to them; this figure was lower in Shapira and Ajami (only 29%). In short, one-third of the inhabitants of the southern neighbourhoods use the services to make

digital payments and interact with various authorities, whereas approximately two-thirds of those in the northern neighbourhoods do so. In terms of social participation and civic engagement, 13% of the inhabitants of Ajami and 16.6% of the residents of Shapira consider the internet a significant tool compared with 18.7% of the inhabitants in Bavli and 28% of the residents in the city centre. In general, only 20% of the residents in Tel Aviv-Yafo perceive the internet to be an important tool for civic engagement, which is inconsistent with the declared statements of policy makers and officials.

More specifically, regarding holding a Digi-Tel card, there is a gap among the district inhabitants. Of the inhabitants in Bavli, 52% hold a membership; this figure is 40% in the city centre, only 14% in Ajami and 20% in Shapira. This discrepancy affects the profiles of those who benefit from the services, including discounts (for cultural events), provided through Dig-Tel. The gap is significant in the southern areas, where only 11.3% use the card often compared with 26% to 28.7% in the northern areas. This gap is also apparent for the people who do not use Digi-Tel at all, at 62% in Shapira and 76% in Ajami but only 31.7% in Bavli and 36.7% in the city centre. Therefore, in terms of benefits and discounts, the municipality is supporting the already well-off neighbourhoods. Overall, the results reveal a correlation between socio-economic background and the use of digitised platforms and digitised services; more established inhabitants use them more often and are more alert to the digitised world. More specifically, in the case of Tel Aviv-Yafo, Digi-Tel usage deepens the existing divide between the north and the south. These results support the argument that participation is not even or broadly based. If not directly addressed, these differences will increase the existing social divides.

A: Communication via e-mail and social media (χ²=32.177; df=12; p<.05)

B: Interaction with public authorities (e.g., electricity, water, and taxes) (χ²=59.198; df=12; p<.05)

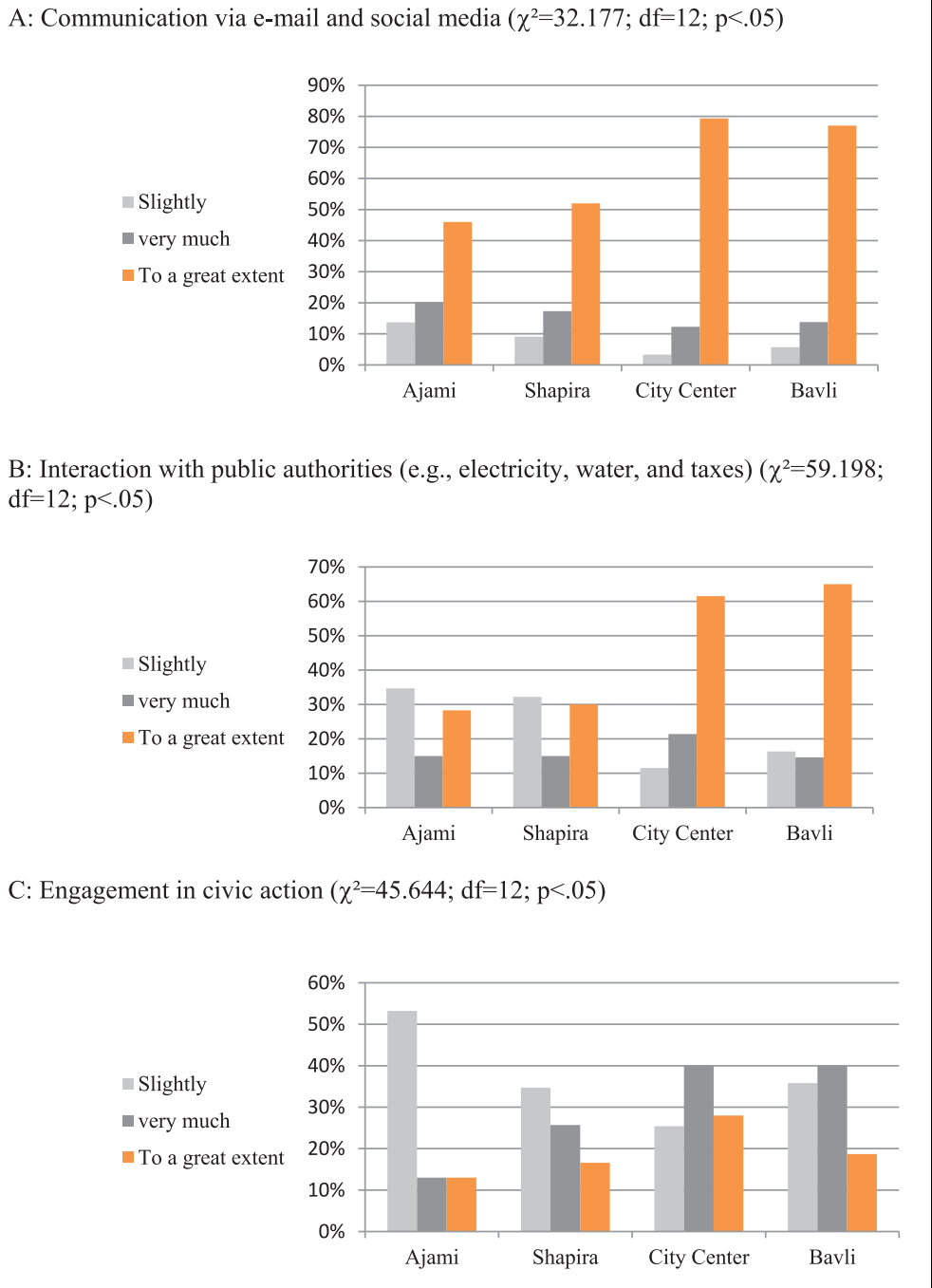C: Engagement in civic action (χ²=45.644; df=12; p<.05)

Figure 3. Digital interactions.

Privacy

Internet skills and digital use also affect inhabitants' awareness of and sensitivity to privacy issues. Thus, the neighbourhoods differ significantly regarding residents' awareness of and sensitivity to the municipality's collection of their information. Almost 85% of the inhabitants in Shapira are not concerned or are only slightly concerned about the collection of information compared with 66% of the inhabitants of the city centre and the northern areas, who are bothered to a much greater extent (Figure 4). The neighbourhoods also differ significantly in terms of the inhabitants' perceptions of data collection regarding their consumption habits, cultural habits and general interests. In south Tel Aviv-Yafo, 83% of the inhabitants are not bothered by data collection, compared with 66% in the city centre. This finding shows a correlation between use (the city centre is more active on digital platforms) and awareness of privacy issues. The findings are similar with regard to data collection on children, such as on participation in educational activities and classes, which does not disturb or only slightly disturbs 83% of the inhabitants in Ajami and Shapira and 63% of those in the city centre. Therefore, 34% of the inhabitants of the city centre are disturbed by the municipality collecting information about their children compared with 14% in Ajami and Shapira.

Regarding inhabitants' perceptions of the municipality's commercial use of their data, the differences among the neighbourhoods are clear. In total, 40% of the inhabitants in Ajami agreed that the municipality could transfer their information to commercial entities compared with 16% of the city centre inhabitants. In Bavli, 83% of the inhabitants did not consent to the use of their information for commercial purposes. More inhabitants overall (80%) objected to the commercial use of their information regarding their habits.

Between participation and the perception of privacy among users

The survey findings reveal consistency at two levels. First, participation patterns and privacy conceptions are associated with one another such that as the use of digitised platforms increases, so does the awareness of risk and privacy issues. Second, socioeconomic background, neighbourhood of residence and digital skills are associated with one another. These links influence the scope of participation of inhabitants in the city and the profiles of users and non-users (Figure 5).

In assessing the results of the survey as a whole, two key parameters are relevant to the link between participation and privacy: age and ethnicity. In terms of age groups, the relatively largest group of users is the adults group (35–54 years), 45% of this group are users. Only 38% users are found in young group (18–34 years) and 24% users in the senior users' group (55+ years). The group of adult users is mostly parents who are more settled in the city and more engaged with municipal affairs (e.g. education, child welfare and community activities). This finding indicates that use is related to needs, not necessarily digital skills. Age is also viewed as a parameter that influences information security, and younger users (18–34 years) are more likely to use difficult passwords (77%) than users older than 55 years (45%). The second factor, ethnicity, is also relevant when assessing the use of municipal services; most of the Arab inhabitants never/seldom use these services (86%) compared with 58% of Jewish inhabitants. This finding also relates to perceptions of privacy and municipal power, with 54% of Arab inhabitants refraining from giving information. Considering that surveys show that the digital gaps between Jewish and Arab inhabitants are shrinking (Israel Internet Association, 2017), this study

A: Collection of geographical information (χ²=53.402; df=15; p<.05)

■ Not at all\Slightly
■ Moderately
■ To a great extent

B: Collection of information on children (χ²=47.086; df=15; p<.05)

■ Not at all\Slightly
■ Moderately
■ To a great extent

C: Collection of information on cultural habits and general interests (χ²=52.382; df=15; p<.05)

■ Not at all\Slightly
■ Moderately
■ To a great extent
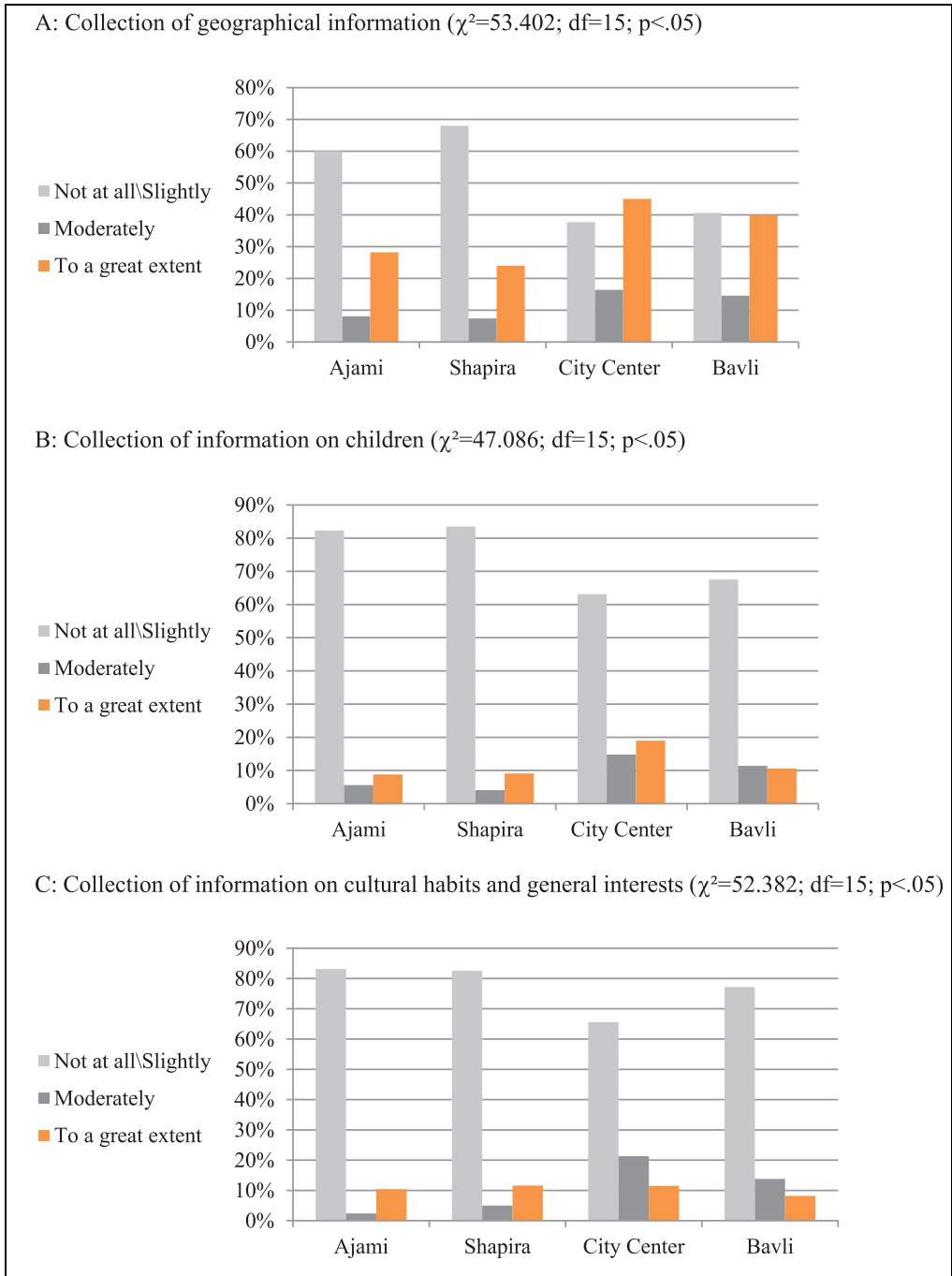
Figure 4. Do you find the collection of data disturbing?

A: Digital use and data security(χ^2=20.583; df=4; p<.05)

B: Digital use and privacy of location (χ^2=20.485; df=4; p<.05)

C: Digital use and privacy – share information with third party(χ^2=19.599; df=4; p<.05)

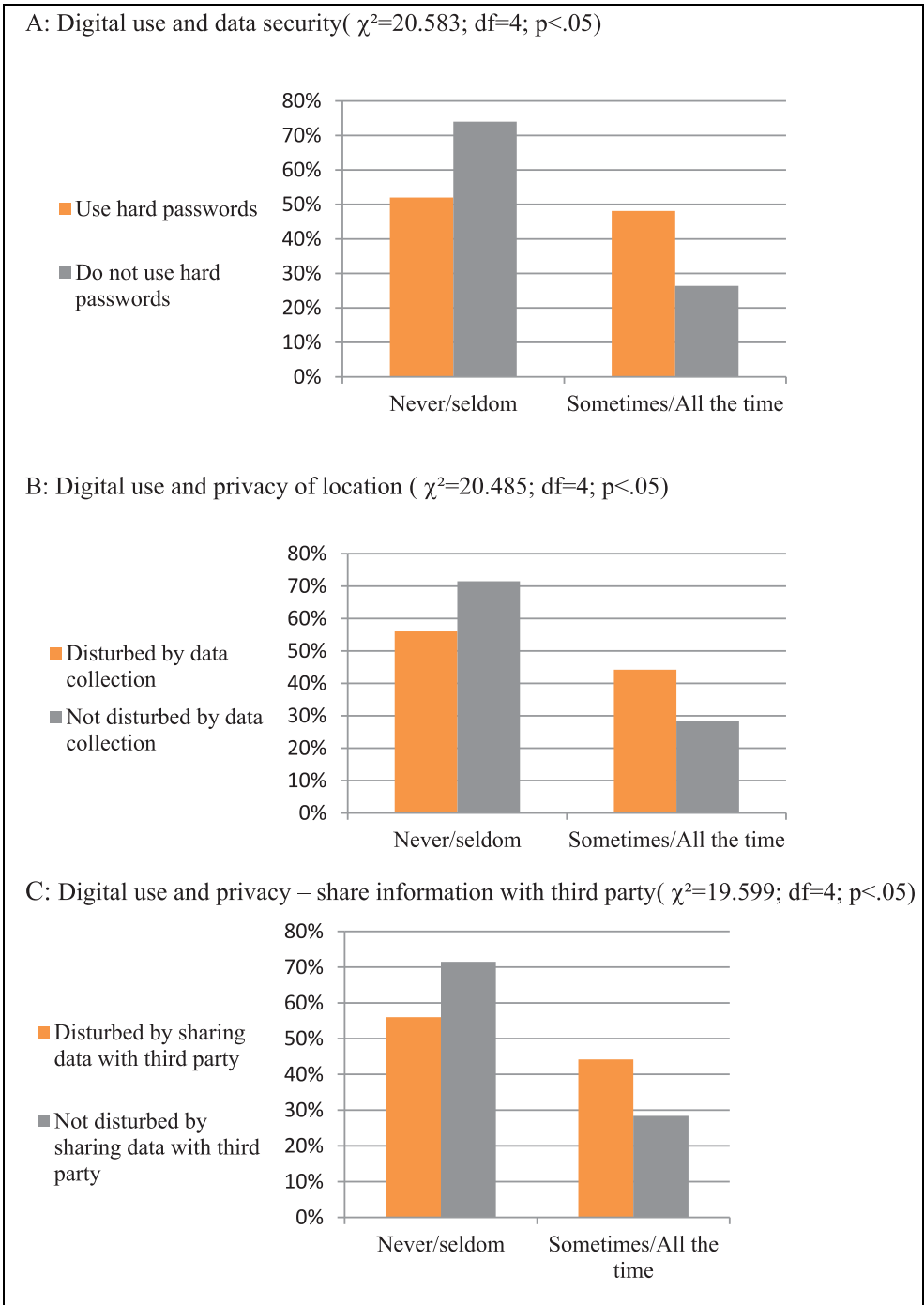**Figure 5.** Participation and privacy.

supports these findings with regard to smartphones, e-mail and social media. However, in terms of using municipal digital platforms, Arab inhabitants are found to be detached and not engaged. This finding may be explained by the fact that Digi-Tel is accessible in Hebrew only (the municipality website is also accessible in Arabic), a mistrust of institutional platforms, or a lack of a sense of belonging (Monterescu and Rabinowitz, 2007).

These findings illuminate how digital skills and socio-economic divides are only part of the explanation for why people choose to use or not use municipal platforms. Daily needs, age, ethnicity and socio-economic background influence the practices of participation. Furthermore, the level of participation is increasingly influenced by perceptions of privacy and by personal choices. With residents' growing awareness of their own power as well as of the risks that they are taking in using digital platforms, the complexity of the smart resident profile is enhanced.
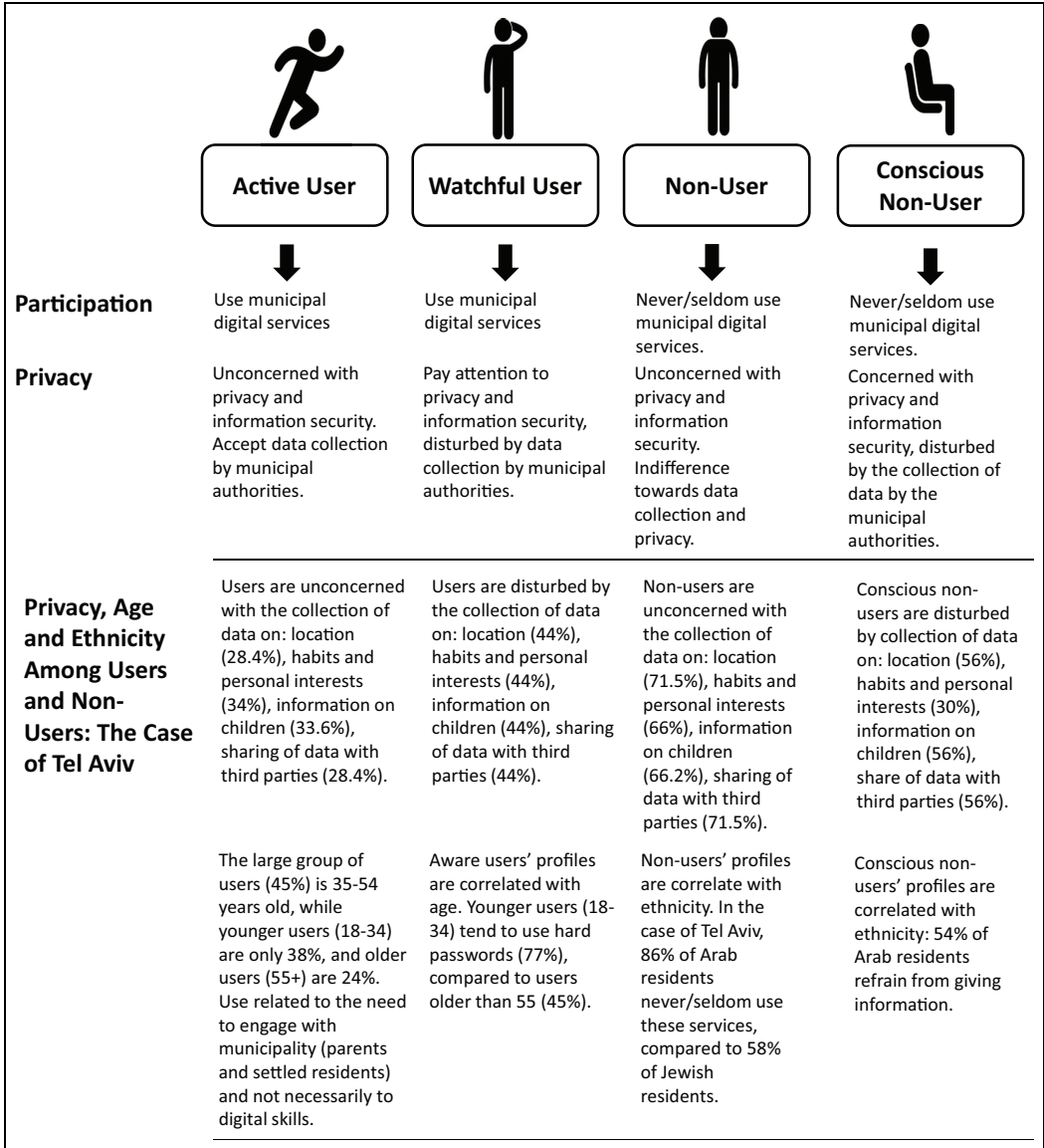
Conclusions: Not at any price, defining your own profile in using municipal digital platforms

Urban 'smart' residency is an evolving concept, and context and time have played key roles in its evolution. Participation is perceived as an ideal to which to aspire, and digitisation allows participation in urban affairs to be effortless and immediate. However, in most cities, despite the leadership using the flag of democracy, the implementation of digital participatory platforms is often top-down with no involvement of the residents. Digital participatory platforms, in terms of content, rights and scope of monitoring use, are all dictated by the policy makers and chief information officers. This shift in the infrastructures of communication over the past 30 years is 'changing

fundamentally the nature of institutional power' and the manner in which it affects peoples' lives (Couldry, 2017: 182). These institutional mechanisms also remake urban residency, with residents becoming 'operatives in the processing of urban environmental data' (Gabrys, 2014: 41). In many cities, there is no escape; digitisation has become a central tool for communication with local institutions and the provision of services.

Although digitisation is an unavoidable process, participation itself is not unified. There is no one prototypical smart resident; rather, there are multiple profiles. Based on the study in Tel Aviv-Yafo, four key prototypical profiles have been identified: the active user, the watchful user, the non-user and the conscious non-user (Figure 6).

(1) *The active user*. A resident who uses municipal digital services for payments, communication, registration, information and entertainment. Generally, these users are unconcerned about privacy and information security, and they perceive these issues to be part of contemporary urban residency. This user fits the ideal of the municipalities, which aspire to increase the numbers of smart active residents in the city. In the case of Tel Aviv-Yafo, this profile applies mainly to the holders of the Digi-Tel card, who are generally unconcerned about the collection of data on location (28.4%) and habits and personal interests (34%), the collection of information on children (33.6%), or the sharing of data with a third party (28.4%).

(2) *The watchful user*. A resident who uses municipal digital services for payments but also pays attention to privacy and information security (chooses strong passwords, deliberately provides incorrect information) and is disturbed by data collection by municipal

	Active User	**Watchful User**	**Non-User**	**Conscious Non-User**
Participation	Use municipal digital services	Use municipal digital services	Never/seldom use municipal digital services.	Never/seldom use municipal digital services.
Privacy	Unconcerned with privacy and information security. Accept data collection by municipal authorities.	Pay attention to privacy and information security, disturbed by data collection by municipal authorities.	Unconcerned with privacy and information security. Indifference towards data collection and privacy.	Concerned with privacy and information security, disturbed by the collection of data by the municipal authorities.
Privacy, Age and Ethnicity Among Users and Non-Users: The Case of Tel Aviv	Users are unconcerned with the collection of data on: location (28.4%), habits and personal interests (34%), information on children (33.6%), sharing of data with third parties (28.4%).	Users are disturbed by the collection of data on: location (44%), habits and personal interests (44%), information on children (44%), sharing of data with third parties (44%).	Non-users are unconcerned with the collection of data on: location (71.5%), habits and personal interests (66%), information on children (66.2%), sharing of data with third parties (71.5%).	Conscious non-users are disturbed by collection of data on: location (56%), habits and personal interests (30%), information on children (56%), share of data with third parties (56%).
	The large group of users (45%) is 35-54 years old, while younger users (18-34) are only 38%, and older users (55+) are 24%. Use related to the need to engage with municipality (parents and settled residents) and not necessarily to digital skills.	Aware users' profiles are correlated with age. Younger users (18-34) tend to use hard passwords (77%), compared to users older than 55 (45%).	Non-users' profiles are correlate with ethnicity. In the case of Tel Aviv, 86% of Arab residents never/seldom use these services, compared to 58% of Jewish residents.	Conscious non-users' profiles are correlated with ethnicity: 54% of Arab residents refrain from giving information.

Figure 6. Profiles of municipal digital users and non-users in contemporary cities.

authorities. This watchful user, who does not take for granted the collection of data, might be a source of challenges to the municipalities, requiring them to examine and explain the extent of monitoring and data collection. In the case of Tel Aviv-Yafo, this profile applies mainly to the holders of the Digi-Tel card, who are disturbed by the collection of data on location (44%) and habits and personal interests (44%), the collection of information on children (44%), and the sharing of data with a third party (44%).

(3) *The non-user*. A resident who never or seldom uses municipal digital services. Generally, this user is unconcerned about privacy and information security. His or her indifference towards data collection and privacy can be viewed as a lack of awareness or a lack of relevance, or disinterest. This user is the person in whom municipalities invest most heavily since they view these residents as having the potential to become smart residents. In the case of Tel Aviv-Yafo, this profile applies to non-holders of the Digi-Tel card, who are unconcerned about the collection of data on location (71.5%) and habits and personal interests (66%), the collection of information on children (66.2%), and the sharing of data with a third party (71.5%).

(4) *The conscious non-user*. A resident who never or seldom uses municipal digital services. This user is highly concerned about privacy and information security and is disturbed by the collection of data by municipal authorities. The emergence of this profile could be seen as the first sign of resistance to the oppressive powers of digital technologies. This resistance might not be sustainable, but it certainly delays the process of city digitisation implementation. In the case of Tel Aviv-Yafo, this profile applies to non-holders of the Digi-Tel card, who are disturbed by the collection of data on location (56%) and habits and personal interests (30%), the collection of information on children (56%), and the sharing of data with a third party (56%).

These four prototypical profiles are not comprehensive. With the evolution of the smart resident concept, it is expected that other profiles will emerge. Profiles should also be viewed in the context of the city's technological developments, privacy, age, ethnicity and other parameters, which add layers of complexity to users' profiles and gaps in the city. Moreover, these prototypical profiles should not be viewed linearly; that is, a non-user will not necessarily become a user with the municipality's encouragement or support. The smart resident has become a debatable concept, not only among scholars but also among inhabitants. Indeed, municipalities tend to see the variety of users' profiles as part of the adaptive process of digitisation, linking it to skills and a lack of knowledge or capability for digitisation, which is a patronising approach that perceives the non-user as being in the process of becoming an active user. Furthermore, the profiles of the watchful user, mainly typifying young users, and the conscious non-user, mainly typifying marginal groups, indicate that residents are conscious actors who have the power not only to participate but also to choose not to participate, and to monitor their own information security. In this sense, residents dispute the normative assumption that conflates smartness with digital participation. This finding raises new questions regarding the accessibility of services and social rights

provided by the municipality, particularly how these services are provided when not all residents consent to or, in extreme cases, some may completely reject the use of digital platforms. It also highlights the challenges in implementing digital platforms in the city, on the one hand, and keeping it inclusive, on the other hand.

Clearly, these profiles must be understood in the context of residents' social capital. The watchful user and the conscious non-user are residents who are more informed. In the case of Tel Aviv-Yafo, it is too soon to know whether these people will use their capital and awareness to modify the implementation and use of the urban platforms by extending their personal awareness through the opening of public debate or mobilisation. However, it can be argued that the municipalities' awareness of the varied profiles of users, specifically those who choose to be smartly connected (Calzada and Cobo, 2015: 14), will gradually enforce a more open approach by the municipalities towards the collection and use of data. This dynamic is not about going back and re-creating a disconnected world but about people taking personal control over an issue that is not sufficiently publicly debated, discussed or challenged.

Thus, being a smart resident in the digital age does not necessarily mean active participation but rather reflexive participation: choosing the means and conditions of participation, keeping choices open, being selective and using digital platforms strategically. Being smart also implies negotiating the role, scope and practices of digital municipal platforms. The smart resident is the conscious, reflexive digital user.

Methodologically, and to further address the conceptualisation of the smart resident in the digital city, two points should be emphasised.

(1)   Participation should be understood as reflecting a broader spectrum of parameters and choices. It is necessary to go beyond the normative perception that non-users are disadvantaged and instead to view their (lack of) participation within a wider set of parameters. Not all users accept the normative premise that public participation through digitalised platforms is essential or even mandatory for daily conduct in the city.

(2)   Participation and privacy should be viewed as linked. The profiles outlined above suggest that the approaches of residents to participation and privacy are complex and far from passive. To be sure, the 'smart' resident is not necessarily one who participates in and uses a digitised platform; he or she might benefit less from municipal services but also might consume less and surely will be monitored and disciplined less. Owing to the authoritarian nature of information and computing systems, inhabitants' conduct in the city shows that some are reluctant to receive the services offered and do not see the benefit of using digital institutional platforms.

It is important to remember that digitised platforms re-constitute only a fraction of what is called 'public'. There is no doubt that digitised platforms enhance participation and empower (some) residents. However, digitised platforms do not re-constitute 'the public'. To date, they have been designed based upon over-simplified assumptions of responsible participating residents while ignoring key issues, such as motivation, power and legitimacy (Kolsaker and Lee-Kelley, 2008: 727). Thus, although theoretically the web is well positioned to enhance

democracy by providing new forms of mediation between citizens and the state, it is unlikely to do so. As the Deputy Mayor of Tel Aviv-Yafo (2016) admitted, 'Is smart citizenship a tool for social change? Today, we have more participants in the southern part of the city involved in city processes than when there was no Digi-Tel. Much more. Enough? Not at all. Does this create the biggest change? Do I base the need to shrink social gaps in the city of Tel Aviv-Yafo on the digital systems? Definitely not.'

Finally, most platforms are top-down initiatives defined by policy makers and computation people. However, it is essential that their platform designs be open to public debate and negotiation, specifically on issues of privacy and data collection. The techno-utopian vision of the smart resident, defined by governments and private companies that benefit tremendously from the technological grip of citizens and their daily shared data, requires critical revision.

As claimed by Bruno Paschoal and Kai Wegrich (2019: 129), digital urban governance innovations are often seen as either 'politically neutral – that is, "just" improving service delivery – or as politically beneficial, that is, "empowering" citizens or enhancing bureaucratic accountability'. However, it is necessary to deliberately explore how these tools are used to shape political urban governance and the access to services and social rights provided by the municipality in the digital age. Thus, although smart resident projects are a political initiative used as a tool to enhance communication and democratic participation in many cities, they have not necessarily evolved or been managed democratically. Residents cannot abolish these types of initiatives, but they can define their profiles and scope of participation. Ultimately, it is the residents who give meaning to and supply the content of the idea of residency and what counts as being smart.

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