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The citizen in the smart city. How the smart city could transform citizenship

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Abstract: Smart city-policy makers and technology vendors are increasingly stating they want to bring about citizen-centered smart cities. Yet, it often remains unclear what exactly that means, and how citizens are envisaged as actors in smart cities. This article wants to contribute to this discussion by exploring the relation between smart cities and citizenship. It aims to do this by introducing a heuristic scheme that brings out the implied notions of citizenship in three distinct sets of smart city visions and practices: The Control Room envisages the city as a collection of infrastructures and services; The Creative City views the city from the perspective of (economic) geography and ponders on local and regional systems of innovation; The Smart Citizens discourse addresses the city as a political and civic community. These smart city discourses are mapped against two visions on citizenship and governance taken from political philosophy. A ‘republican’ perspective with strong presence in social-democratic countries is contrasted with a libertarian one, most prominent in Silicon Valley approaches to smart city technologies. This provides a scheme to reflect on potential benefits and downsides if a specific smart city discourse would develop. Instances of smart cities may promote notions of citizenship that are based on consumer choice and individual responsibility, alternatively they could also reinforce collective responsibilities towards the common good of society.

Keywords: Smart cities, civic media, smart citizens, urban informatics, citizenship.

ACM CCS: Human-centered computing → Human computer interaction (HCI) → HCI theory, concepts and models

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1 Introduction

In the last few years, various authors [16, 21] have signaled a shift in the debate on smart cities. Increasingly, technology companies as well as local governments have started to explicitly incorporate the well-being of citizens in their smart city-visions. This shift occurs at the moment smart cities had come under increased critical scrutiny. Many have pointed out that smart city-approaches had been rather top-down, techno-centric and technocratic examples of solutionism, serving the interests of corporations and governments rather than actually improving the quality of life for actual citizens [3, 16, 31, 45, 54, 79]. It is not quite clear yet to what extent this shift in the debate is merely lip service to its critics or to what shift this may lead in smart city development. More importantly, it is often left unsaid what exactly is meant with more citizen-centered approaches.

This article wants to contribute to the debate about citizen-centered smart cities by further exploring the relation between smart cities and citizenship. It aims to do this by linking three smart cities discourses against ideological perspectives regarding citizenship. By doing so, it assumes that smart city visions embed ideologies linked to roles and responsibilities of citizens. Two ideological stances are identified as being present in the debate and are further operationalized. First, a (neo)liberal or libertarian perspective departs from individual freedom and laissez-fair government involvement; Second, a republican perspective that is often connected to a social-democratic political perspective allows a more active stance by government and civil society actors to safeguard public values and allows individual freedom to function within these boundaries [49, 76]. Mapping these perspectives to existing discourses of smart cities allows insight in the potential development of individual versus collective responsibility in the smart city development.

1.1 Understanding the smart city: visions and practices

In this article, the smart city is approached as a discourse: ‘an ensemble of notions, ideas, concepts and categorisa-

tions through which meaning is allocated to social and physical phenomena, and which is produced and reproduced in an identifiable set of practices' [46]. In this view, the notion of the smart city is one of a number of 'contemporary language games around urban management and development' [71]. Various parties are active in this 'game': city officials, corporations, civil society organizations, academics, experts, etc. Together they formulate the ways cities are understood and envisioned and this in turn influences and justifies policy, investment, resource allocation, urban planning and technological development. Smart Cities then can be understood as 'urban imaginaries'; a set of 'visions, hopes, and fears – rational or irrational, fact based or emotionally appealing – [that] may directly affect government policy decisions, design criteria, investment by venture capitalists, people's stances toward a new product, and so on' [78].

This implies that the smart city as a 'discourse' is more than just a 'game' or merely a *fata morgana*. It should be understood as a performative term, as it allows various parties to rally behind a collectively recognized flag in order to (re)shape the city according to the vision articulated in the notion of the smart city. In addition, the smart city can also be understood as an 'assemblage' – a group of actors both of human and non-human kind, that together shape actual urban practices.

This article approaches the smart city from this double position: a particular set of visions on the city, as well as a collection of concrete practices enacted by coalitions of actors that bring about an 'actually existing smart city' [70]. Although visions shape the assemblages that afford these practices to emerge, this relation should not be understood in a deterministic way. The actors involved in shaping the practices may or may not overlap with those proclaiming the visions, and technologies researched and developed from a particular vision can always be appropriated in different ways. Smart cities are not imposed, but should be understood as 'working arrangements' which both derive from multiple deliberate processes of formation and are subject to ongoing stabilising and destabilising influences [21].

As Hajer and Dassen have noted, around discourses such as the smart city, a process of 'discourse structuration' and 'discourse institutionalization' takes place. Over time, they write, 'a discourse may become the new 'normal', accepted way of seeing. It then starts to institutionalize in new rules and routines, in laws, new business models, new roles for state agencies and market, citizens and experts, and even newly shared values' [47]. From that point of view, the ways smart city visions and practices de-

fine and afford notions of citizenship are of particular interest.

1.2 Citizenship in the smart city

Following Isin and Turner, citizenship here will be understood not so much as the formal set of rights and obligations bestowed upon members of a polity, but rather as a social process 'through which individuals and social groups engage in claiming, expanding or losing rights' [52]. Through interactions between various actors, citizenship then is 'an institution which is constantly challenged and reshaped' [76]. Smart city discourses and practices in this vision do not just reflect various (implied) notions of citizenship, but through their organizational models and interactions that smart city technologies afford, may add to the repertoire of envisioned and enacted practices of citizenship. Digital infrastructures such as smart cities may constitute both 'new acts of citizenship' as well as 'a wider set of processes that constitute civic culture's starting-points' [20].

This continuous process of redefining what it beholds to be a citizen – in terms of rights and responsibilities vis-à-vis the polity as well as other members of the community – can be related to a broader normative debate between various higher-level visions of citizenship. As De Waal [79] has shown, smart city practices and discourses can be contextualized in a variety of ideal-typical political-philosophical perspectives on citizenship and governance. He brings out two of these as particularly relevant for debates about smart cities: a libertarian or liberal perspective and a republican one [79]. In libertarian and liberal ideology, citizenship is mostly understood as a set of individual rights, and contains only a minimal notion of virtue or mutual responsibilities between members of the polity. Republican visions instead combine individual freedom with a collective sense of responsibility vis-à-vis the polity as a whole, thus requiring a 'thicker' notion of citizenship, expecting active involvement of citizens in the community. Republican here refers to the notion of *res publica*, or the common good, not to the American political party. It is an ideology that underlies social-democratic political perspectives [52] in which governments and civil society actors such as for instance unions play an important part in the determination and safeguarding of public values.

Both ideologies imply different types of relations between state, market and citizens. Liberal and especially libertarian ideology departs from a state exercising restraint in the organization of social and economic affairs;

these are best left to the market. In republican views, the state takes a more active stand as a guardian that on behalf of the citizenry oversees the organization of public values in society [52]. Both perspectives mainly relate to the functioning of democratic political systems, and are therefore mostly suited to analyze smart city visions in democratic countries.

Various authors have started to explore the [implied] roles of citizens in relation to smart city visions and practices. Foth has described how in the debate on smart cities, the relationships between city governments and citizens have been reconfigured a number of times. Whereas their relationship was originally conceived of one between administrator and residents (Cities 1.0), this has been reconceived as the relation between ‘service provider’ and ‘consumer’ (Cities 2.0), ‘facilitator’ and ‘participants’ (Cities 3.0) and now is increasingly understood as one between ‘collaborator’ and ‘co-creator’ (Cities 4.0) [30].

Using Arnstein’s Ladder of Participation [5] as a point of departure, Cardullo and Kitchin [16] have explored various levels of involvement of citizens in smart city practices in Dublin. They identified sixteen different roles for citizens in four categories they labeled Citizen Power, Tokenism, Consumerism and Non-Participation. Individual roles vary from leader, decision-maker and co-creator via participant, recipient, and consumer to user and data-point. Correspondingly, citizen involvement varies from formulating visions for urban policy to contributing ideas for concrete development projects, to giving feedback and suggestions on existing plans, to consuming urban services and providing data and further to being steered, nudged and controlled. In a study exploring ways in which citizens contribute to social innovation, Angelidou and Psaltoglou find four types of citizens, they have called Senior Citizens, Sharing Citizen, Collaborative Citizen and Entrepreneurial Citizen [4]. Cowley et. al. discern four different modalities of publicness. *Service-users* are consumers of public services, resources and infrastructures like public transport; In an *entrepreneurial* modality, citizens are addressed as co-creators or innovators of smart services, for instance through their participation in hackathons. *Political* dimensions of citizenship come to the fore when citizens have actively become part of the decision making process. As parts of civic publics, citizens mobilize themselves around all kinds of issues outside both the institutions of state and market, like volunteering or organizing neighborhood activities [21].

As both Cardullo and Kitchin and Crowley indicate, more active roles for citizens are not necessarily a desired goal. Processes of participation could be exclusionary involving only a segment of the population. Addi-

tionally, expert knowledge could also be advantageous for citizens [16], and citizen input can also be facilitated through regular channels such as the organization of pressure groups or voting in elections that may hold the organizers of these services accountable [21]. An analysis of the roles of citizens in smart city visions and practices is valuable as they are part of the broader set of social practices through which notions of citizenship are continually re-enacted and take shape. It is those visions and practices that we will now turn to.

2 Citizenship in smart city: visions and practices

There is no such thing as ‘the smart city’. Definitions vary from simply using ICT to optimize the management of urban infrastructures to fully fledged visions of cities as integrated systems in which local governments, civil society, and companies interact in new ways to improve quality of life in domains of health, education and leisure, working towards ‘smart’ economic growth while making our energy consumption more efficient and contributing to environmental friendly or even ‘circular’ cities. Similarly, smart city projects vary in scope from newly built cities like South-Korean Songdo – a \$40 billion investment – to a town like Stratford in Canada with a population of 32 000 that boasts that its broadband connectivity and city marketing activities have gained it a place in the Top 7 Intelligent Community of the Year rankings. For the purpose of this article, smart city visions and practices described in a number of key academic articles have been explored [1, 2, 13, 15, 17, 26, 29, 31, 48, 53, 54, 57, 63, 75, 78, 79].

From these, three (partly overlapping) sets of discourses and practices emerged that are relevant for the relation between citizenship and smart cities. These sets have been selected as they address three different aspects of city-making. The Control Room envisages the city as a collection of infrastructures and services; The Creative City views the city from the perspective of (economic) geography and ponders on local and regional systems of innovation; The Smart Citizens discourse addresses the city as a political and civic community. In the following sections each of these three sets of discourses and practices and their implications for citizenship will be further explored.

2.1 The Control Room

The Control Room-version of the smart city revolves around the optimization of urban processes, from transport and safety to energy provision [11, 45, 54]. The underlying rationale is that due to the rise of sensor technologies and other real-time data producing digital platforms, urban processes can be better understood and managed. Through processing the data by algorithms, better decisions can be made about the organization of urban processes and the allocation of resources. The underlying goals can vary from making cities more sustainable, to saving (or making) money, to increasing efficiency or making cities more comfortable and enjoyable. Batty and Townsend [7, 73] placed this approach in a longer tradition of using computers to analyze data in urban planning that emerged after the Second World War. Batty pointed out, that data processing systems take an active role in current city-making. In addition to using computers to analyze or model urban processes, smart city-technologies also actuate upon data in real time [7].

The Control Room comes in (at least) two versions. The first takes the form of government-ran operation centers and urban dashboards. The most iconic materialization of this vision is found in the Centro De Operacoes Prefeitura Do Rio, Rio de Janeiro's City Operation Center. The center resembles a NASA-style control room in which city administrators monitor flows of information presented at numerous screens, from weather forecasts and traffic-cams to trending topics on social media [55]. Various urban agencies are present in the room, and use incoming data to collaboratively draw up an appropriate reaction. In addition there is also a gallery for the press, where journalists can follow incoming data streams and the reaction of the government. This paradigmatic example aside, many local governments and affiliated agencies have over the last years invested in 'urban dashboards' [24, 55, 65] that can display urban processes varying from traffic management to predictive policing. In addition, through open data programs, many governments have started to offer these data streams to the wider public.

Another manifestation of the control room are miniaturized versions that appear as smart phone apps. These allow consumers to tap into urban data streams that can be used to personalize the urban experience. For instance, in the domain of urban transport companies like Moovel and Whim offer individual users real time urban transport planning, combining a broad variety of transport modalities, from bike sharing schemes and public transport to ride hailing services such as Uber [25]. These micro-version 'control rooms' for the organization of one's pri-

vate life are easily available for download to one's mobile phone. These kind of applications have been called 'the city as a service' [51], in which new technologies promise to 'seamlessly' reveal the city as a series of individualized services, offered by a variety of mostly commercial providers [78]. In effect, this could bring about a 'platform society' in which many of our everyday urban interactions such as transport, hospitality and dating are managed through the interfaces and data-processing algorithms of platforms such as Uber, Airbnb and Tinder [25].

In the Control Room discourses, citizenship is understood in a variety of ways. In the framework of government run control rooms, citizens are cast as subjects of (local) governments that operate on behalf of them, in order to protect them or nudge them in a particular direction that is understood as serving a public interest. In the examples of personalized platforms, citizenship is mostly understood in what Cowley et. al. call the service-user modality. Citizens can make use of platforms as consumers to optimize their individual lives, or in some cases use these platforms to offer their services as micro-entrepreneurs. In both visions, citizens are also active as data-producers that through their various interactions and uses of the city both actively and passively contribute data.

Potentially, these control rooms could contribute to more resilient and sustainable cities, and provide citizens with the means to enjoy the city's offerings in an individualized manner, possibly providing them with new forms of agency, as citizens can now make use of open data or offer their services through digital platforms. However, from a citizenship-perspective the control room vision has also been called problematic for a number of reasons. First, the control room approach tends to depoliticize and obscure important decisions with regard to the management of public values. Proponents of this approach, applaud it for its neutral capacities for urban problem solving, epitomized by the statement of former IBM CEO Pamisano who declared that smart city technologies are "refreshingly non-ideological" [50]. However, various authors have countered that the organization of infrastructure is always 'deeply political' [47], as decisions have to be made about its defaults, priorities and processes of inclusion and exclusion. However, the algorithms that render the smart city are rather untransparent. As Mattern asks, 'What should a city optimize for?' [62] – economic growth, sustainability, equality – is always a political question, that now takes shape in opaque algorithms. Even the collection of data itself is a process that is not a neutral representation of reality, but embedded in social and ideological positions [41, 55]. As amongst others Kitchin and Foth have indicated, the problem is not that the data and the way

it is processed is not useful, but rather that the process is black-boxed, outside the scrutiny and control of the public [29, 55], and often implemented without debate about the ways they safeguard or jeopardize public values.

A second set of criticisms states that the conceptualization of the city as a collection of services that can be offered to individuals could lead to more personalized experiences of the city [43], turning cities into consumer-optimized zones [58] and undermine more collective imaginations of citizenship, solidarity and mutual responsibility, feeding into a neo-liberal individualist ethos of consumerism, where the market determines what is best for citizens [16, 44].

A third set of criticisms raises the issue of privacy loss of subjects, and the ability to promote opportunities for paternalism of both companies and governments. The control room could turn into a new system of governance setting social, cultural and economically normative standards to which citizens are subjected [39, 40, 76], nudging them to behave as good citizens or good consumers. This may lead to the rise of new institutional practices for affairs traditionally bestowed upon democratic governments such as identity and reputation management, yet this time without the transparency and accountability that – at least in theory – are ascribed to principles of the democratic state [25].

2.2 The Creative City

The Creative City is a set of discourses that envisages smart cities as hubs for (technological) innovation, and becomes most apparent in the wish of cities or regions to become ‘The Silicon Valley of ...’ A smart city is then defined as one ‘whose economy is increasingly driven by technically inspired innovation, creativity and entrepreneurship, enacted by smart people’ [55]. In this vision, ‘smart’ revolves not so much around the technologies itself (as in the Control Room), but is centered around the creation of an ‘innovative milieu’ [66] that attracts the right companies and talent, as well as other provisions and facilities that stimulate innovation. Various authors have defined the smart city in this sense. It is connected to the notion of the ‘knowledge city’. For example, Komninos defines smart cities as ‘territories with high capacity for learning and innovation, which is built-in the creativity of their population, their institutions of knowledge creation, and their digital infrastructure for communication and knowledge management’ [56]. Walravens, Breuer and Ballon describe the smart city as a local innovation platform, ‘a meeting place where the public sector, private interest and citizens can

come together to generate new value, to collaborate and innovate together’ [81]. Cities that embrace this approach embrace ‘forward-looking developments’ in order to become ‘well-performing’ in a broad variety of domains, from smart economy and smart mobility to smart environment, and from smart governance to smart community and smart living’ [38].

An example is the Brainport region in The Netherlands that aims to attract creative talent to the region by close collaboration between knowledge institutes (both science and art), government, and high-tech industry to allow innovation to emerge. Government provides opportunities for experimentation and year-round events [61].

This approach to smart cities can be placed in a longer tradition of thinking about cities as sites of innovation, and the particular economic geography as well as managerial orchestration that could facilitate innovation. As a smart city discourse, it has appeared in thinner and thicker variants. The former is mostly focused on creating conditions that attract IT-companies and creative talent. The latter implies a broader vision on urban policy, that not only focuses ‘on the knowledge economy and industrial structure, but also stresses enriched human capital, a vibrant and diverse socio-cultural environment, conservation of the natural environment, a high-quality built environment, accessibility, tolerance and acceptance of multiculturalism, and social equity’ [63]. In this sense, the smart city is mostly a policy discourse to stimulate ‘smart growth’ of cities and regions, for instance by focusing on institutes of higher education [9, 10, 12, 37, 74] or setting up network organizations or other institutes that could ‘orchestrate’ innovation. Part of this discourse contains also a broader call for ‘open innovation’, ‘design thinking’ and ‘living labs’, particular approaches for the organization of innovation that include citizens as co-creators [27, 49, 68]. In Rotterdam, the Vakmanstad (Skill-City) programme has come up with an inclusive interpretation of creative class-theories that includes the working class and aims to revitalize the city by developing educational and socio-economic strategies aimed at blue collar workers [83]. In Australia Foth has argued for the need to define creativity in a broader sense than ‘specialised, secure, white lab coat innovation centres’. Instead it should involve citizens at large, for instance through programmes in maker spaces and coworking spaces. CityStudio Vancouver, New Urban Mechanics in Boston, and London’s Urban Innovation Centre are examples of this approach [28].

In the imaginations of the smart city as a creative city, citizens are conceptualized in at least two different roles. First, citizens are seen as (potential) members of the creative class that needs to be attracted or educated in order

for cities to remain competitive. This has over the last two decades led to policy measures in cities all over the world. The risk here is that cities focus on the needs of international IT-companies and their workforce. If only a segment of the entire citizen population are incorporated in policy this could contribute to polarization, social fragmentation and growing inequality. In extreme cases, this could lead to gentrification of cities, or even the expulsion of non-creative class citizens [18, 19, 35, 64]. Counterweight to such extreme perceptions is found in programmes like SkillCity that aim to include broader strata of society.

In a second role, citizens are cast as co-creators in the innovation processes of the creative city. Events like hackathons invite citizens to contribute to civic innovation. More broadly, living labs are proposed as methods for innovation that include citizens as stakeholders and co-creators [37]. The rise of living labs can be placed in the Northern-European tradition of participatory design that was based on the premise that citizens (workers) were entitled a say in the design of the products that were going to shape their (working) life. Similarly, Living Labs engage citizens early and in the framing of the problem as well as enabling them to contribute solutions [12]. Proponents of such approaches perceive these labs as open innovation alternatives that can counter the risk of ‘platform lock-ins and battle amongst proprietary vertically integrated digital ecosystems’ [21]. In theory, living labs and open innovation could further promote more inclusive processes of city-making and re-enact republican ideals of citizenship. From a more critical perspective, hackathons and living labs could also be seen as disciplinary strategies that teach citizens to embrace the entrepreneurial spirit of the creative city. Through Cowley et al.’s lense, citizens are then seen as members of an ‘entrepreneurial public’ who contribute to the further development of the smart city. Yet, their participation does not necessarily address the more democratic dimensions of citizenship [48]. To discuss those in more depth, the following paragraph will turn to the notion of smart citizens as a third discourse on smart cities.

2.3 Smart citizens

The notion of ‘smart citizens’ first emerged as a counter-discourse against the control-room versions of the smart city propagated by corporations: ‘To date, there has been too much focus on the role of large technology companies and governments as the catalysts of technology-enabled progress’, Hemment and Townsend write in the foreword of their publication on smart citizens that at the time

summarized this rising criticism. ‘With this has come an emphasis on top-down solutions, and on centralised, proprietary systems. ... But something is missing – the aspirations, anxieties and abilities of individuals, communities and small businesses as they struggle to survive, and thrive, in the face of daunting global challenges’ [22].

Since then, the smart citizen perspective has developed in at least two directions. First, it has been embraced by local governments that have started to employ digital technologies to streamline their operations and interactions with their constituents. Digital technologies are used to enhance or optimize traditional operational processes as well as democratic functions, from renewing a driver’s license to the organization of consultation; they are hailed as tools to ‘revolutionize local government, making it more responsive, transparent, and cost-effective than it has ever been’ [3, 32, 80].

In a second direction, citizens and civic organizations have started to use digital technologies to mobilize themselves around issues of collective interest. Claiming their ‘rights to the city’, they have established all kinds of collective activities, often set-up as a commons, varying from occupying public squares to organizing temporary social programmes for vacated offices or storefronts [14, 67]. These practices have by now been come to known under a variety of categories, such as DIY-citizenship [60], tactical urbanism [3, 80] or hackable city-making [42]. The more encompassing term Civic Media has been used for ‘[technological], designs and practices that produce and reproduce the sense of being in the world with others toward common good’ [6, 36]. Part of this development are also practices of ‘participatory sensing’, when citizens have started to gather data themselves, for instance about air pollution as is done in Curitiba, or the problem of damp housing in Bristol [16]. These initiatives can be co-designed by citizens and/or NGOs. Data can be used to organize local communities around particular issues or to hold governments accountable.

The practices described here could be categorized as examples of what Cowley et al. have called political and civic publics. Authors have signaled two risks regarding political and civic publics. The first is that consultation is merely a form of tokenism, where citizens can have their say but are not bestowed with any true influence [42]. A second risk is that citizenship is understood in terms of efficiency in relation to government operations. Such a perspective runs the risk to ‘ossify’ digital media in a solutionist and ‘functionalist paradigm of applied civic technologies’ [82]. Whereas efficiency could be a great goal for the organization of certain bureaucratic procedures such as renewing a driver’s license, Gordon and Mihailidis

have argued that democracy itself is not about efficient bureaucracies; democracy revolves around a whole different kind of ‘efficiency’: the design of a worthy political system that amongst others provides all citizens the opportunity to participate in meaningful ways, mechanisms of governance that are to weigh collective versus public interests and the opportunity for citizens to hold those who govern them accountable.

The practices of DIY-citizenship, in which citizens actuate place in the development of a smart city through newly arranged platforms, signal a shift in the organization of civil society. As Levine has argued, traditional civil society institutions that ‘enlisted’ citizens in collectives such as unions, churches and local newspapers have given way to more disaggregated, individualized social arrangements. Citizens have become ‘networked individuals’ [77] who have started to assemble in much more liquid, ‘networked publics’ [8] through practices of what Bennett and Segerberg have called ‘connective action’ [23, 42].

This societal shift coincides with changing perceptions of citizenship. Dalton has described a shift in citizenship “from a space of duty and virtue facilitated by traditional mechanisms of participation to a space of personal interest, care and self-actualization, facilitated by a multitude of media platforms” [42, 69]. Somewhat similarly, Michael Schudson has noted a shift towards a monitorial citizenship ‘where citizens monitor’ the informational environment in a way so that he or she may be alerted on a very wide variety of issues for a very wide variety of ends and may be mobilize around those issues in a large variety of ways’ [76]. Taken together, these shifts point to a changing landscape in which citizens have started to manage and mobilize around collective and public goals that they identify themselves with, usually on a voluntary basis, and often through the use of digital media technologies.

The DIY-perspective is also not without its critics. First, some have pointed out that these practices of ‘bottom-up’ organization fits in a broader trend of ‘responsibilisation’ of citizens and civic groups for the organization of public values. Using a rhetoric of ‘participation, involvement and responsibility’, governments will outsource responsibility for public value creation to citizen groups [72]. A second criticism concerns processes of in- and exclusion in these DIY-initiatives. Tonkens et. al. found that many of these initiatives mainly attract higher educated and well-connected citizens. As Thomas et. al. write, these initiatives may be based on ‘a right to the city’ yet this right is a common right rather than an individual one, that should be based on ‘the collective exercising of power in the processes of urbanization’ [16]. How then exactly can these civic initiatives be legitimized as repre-

sentative for the citizenry at large? That is a central question that governments currently find themselves wrestling with.

3 Conclusion

From an ideological perspective, the three smart city approaches here open up opportunities for the re-enactment of both (neo)-liberal as well as a republican visions of citizenship. Some researchers have found a tendency that actual smart city practices mostly reinforce neo-liberal visions on citizenship [16, 21, 50]. In these examples citizens are increasingly positioned as consumers of individualized services. This is understood as a neoliberal trend in which ‘the logic of choice, consumption and individual autonomy framed by state and corporate defined and legitimized constraints which prioritize market-led solutions to urban issues’ [21]. Similarly, Cowley et. al. found many examples of ‘service-users’ and ‘entrepreneurial publics’ that cohere with liberal perspectives on citizenship. They had much more trouble locating examples that articulate civic and political aspects of citizenship coherent with a republican point of view [59]. In addition, visions that focus on the collective organization of citizens also run the risk of being co-opted in commercial schemes or caught in the frame of ‘responsibilisation’ in which citizens are made responsible for societal provisions. Van Dijck et al. argued that the emergence of a ‘platform society’ has also led to the rise of new internationally operating corporate actors providing individualized services based on the collection and processing of data. These players have set up their own schemes of governance, including formerly state-based activities such as identity management and reputation systems. This forms an illustration of changing roles and responsibilities between citizens, states, and other actors in response to digitalization and smart city developments [25].

On the other hand, smart city technologies could provide citizens with new means to define collective issues and organize themselves around these. Cities around the world now underwrite these goals in their smart city visions. The Australian city of Melbourne for instance has installed a smart city policy that aims to ‘intelligently prepare [the city] for the changing needs of the community, the environment and the economy [84]. The creative city approach is broadened and could shape towards the development of an inclusive city as the Rotterdam SkillCity illustrates. Foth et. al. have also found that in the Smart London vision, the citizen is placed at the core of developments [33].

This article aimed to contribute to the debate on smart cities by offering a heuristics that can help researchers, designers and policy makers to further articulate the role of citizens in three smart city discourses in relation to two political-philosophical idealtypes of citizenship. The three discourses were singled out in order to bring out in more detail how various aspects of citizenship are articulated; the ideal-typical contrast between liberal and republican notions of citizenship can be used to analyze them ideologically.

While this analysis of smart city discourses against these ideologies can be read as a mostly critical overview of perspectives on citizenship in smart cities, the point is not that all smart city-technologies and practices will automatically erode democracy as we know it. The analysis depicts a spectrum on the positions and responsibilities of citizens either collectively, in groups, or as individuals. Each scenario embeds design and development choices incorporating a degree of inclusivity of (particular) groups. Each of the three discursive visions of the smart city embeds different opportunities and challenges for the development and inclusiveness of society. These heuristics could be helpful for developers as well as policy makers to debate central design principles of smart city technologies. Following Foth et. al., this could promote a further shift in design from ‘usability’ to ‘citizen-ability’, defined as ‘the need for HCI designers to think of ways that our expertise, skills, and the infamous ‘design thinking’ can be employed to designing for new polities and civics’ [34].

To conclude, smart city discourses and their materialization in actual developments is a still ongoing process. New perspectives may emerge in the future and the three perspectives are not mutually exclusive. This paper highlights that ideologies can become materialized in these discourses. Identifying these ideologies brings insights in the strengths and weaknesses, as future developments may develop in a certain direction. The upfront signaling of the downsides can help in creating a balance between different smart city operationalizations and help in shaping a future smart city towards a more sustainable, inclusive and resilient cities, with a high quality of life.

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