CITIZENS' CHARACTERISTICS AND CHALLENGES TO THEIR PARTICIPATION IN PUBLIC LIFE IN CITIZEN-CENTRIC SMART CITIES

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ABSTRACT

While certain smart cities are lauded to be citizen-centric, they are actually not so in practice. Most cities clearly lack a conceptual understanding of the ideal characteristics of its citizens and their involvement in public life. Thus, the objective of this paper was two-fold – to identify the desired characteristics of the citizens of citizen-centric smart cities as well as to discuss the hurdles to citizens' participation in the initiatives of smart cities. This qualitative study has conducted interviews on smart city experts. Conceptually, instead of being passive data users or beneficiaries of services, citizens can actually be active and independent participants of public life, co-producers of public values, as well as human sensors who drive changes through deliberative democracy. It has been argued that the objectives and success of citizen-centric smart cities are completely reliant on a strong understanding of the citizens' characteristics and direct participation in public life. As such, the adoption of a participatory paradigm might support the successful creation of citizen-centric smart cities mainly through public awareness and acceptance of these values.

Keywords: *Role of citizens; participation; citizen-centric; smart city; participatory democracy*

INTRODUCTION

At the moment, although the smart city concept is ill-defined or consisting of a wide variety of definitions from various paradigms (Albino, Berardi, & Dangelico, 2015; Chourabi et al., 2012; Dameri, 2013; ITU, 2014; Lara, Da Costa, Furlani, & Yigitcanlar,

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2016; Mora, Bolici, & Deakin, 2017), it is generally agreed that the three-way interaction between corporates (technology factor), governments (institutional factor), and citizens (human factor) form the fundamental components of a smart city (Capra, 2014; Cavada, Hunt, & Rogers, 2014; Manville et al., 2014; Nam & Pardo, 2011). Thus, apart from emphasizing on technologies, smart cities throughout the world like Smart London or Dublin are striving to achieve citizen centricity. However, the latest studies on Smart London (Willems, Bergh, & Viaene, 2017) and Dublin (Cardullo & Kitchin, 2017) have revealed that the characteristics of the citizens of smart cities are unclear; they were mostly playing passive beneficiary roles. Additionally, these smart cities have not actually attained the stage whereby their citizens are directly involved in public life.

This is a rhetorical trend since there is a lack of conceptual comprehension regarding the exact characteristics desired of the citizens, as well as the degree of citizen centricity of smart cities (Cardullo & Kitchin, 2017). Thus, two objectives have been formulated in this paper. The first was to identify the characteristics of smart city citizens with a focus on citizen centricity. The second was to discuss the issues concerning the participation of the citizens in public life. As such, two of the research questions that have been attempted to be answered through this empirical study were (1) whether there were new characteristics and roles for a citizen, and (2) whether the citizens' participation in public life would enable them to be more directly involved in smart cities with respect to Arnstein's ladder. The following section will review the literature in terms of citizen centricity, citizen's characteristics, and their participation in public life. Next, the methodology will be explained and the results analysed. The findings will be discussed with respect to the definition of citizen centricity and selected characteristics of smart cities' citizens (with stress on citizen centricity). Suggestions for the rectification of the challenges associated with the citizens' participation in public life will also be elucidated. Finally, the contributions of this study will be explicated with reference to the findings.

LITERATURE REVIEW
Citizen centricity
This topic has been discussed in European e-government literatures. In 2005, the UK Presidency of the EU, held a Ministerial Conference and adopted the declaration of the conference, which was to give more precedence to citizen centricity in political and e-governmental agendas (Berntzen, Johannesen, & Ødegård, 2016). In the handbook for citizen-centric e-governments, Undheim & Blakemore (2007) had defined citizen centricity together with e-government viz. citizen-centric eGovernment services are

designed to deliver increasingly cost-effective, personalized, and relevant services to the citizens. They also serve to enhance democratic relationships as well as promote better dialogues between the citizens and government, which in turn enhances the practice of citizenship within the society. On the same note, six factors have been identified to be able to promote citizen-centric e-government services. These included (1) better access, (2) fully customer-dedicated front offices, (3) lighter and smarter back-offices, (4) flexible and stable organizations, (5) learning beyond the organization, as well as (6) understanding customers and building relationships. With reference to the last factor, there has to be a critical participative and trusting relationship between the government and citizens. Also, citizens should understand the relationship between their right to receive services from the government, as well as their obligations when using the same (Undheim & Blakemore, 2007).

Berntzen et al. (2016), who had a similar view with Undheim & Blakemore (2007), classified citizen centricity into two perspectives: internal institutional identity factor and external citizen factor. The former is influenced by two indicators: culture (which represents the past, roots, and hence, core identity) as well as image (which represents the future demands or wishes of the citizens). On the other hand, the external citizen factor is significantly influenced by the internal factors. With this understanding, citizens should be allowed to engage in all levels of the development of public products and services. There should be sufficient, not superficial, user involvement. To put into perspective, at the individual level, each user can speak for himself/ herself; at the system level, some users can speak for the rest; and at the policy level, user organizations can speak on behalf of the users. After all, the main idea of citizen centricity is the establishment of a collective mindset in both public sector employees and decision-makers to learn from the users of services in order to make these better (Berntzen et al., 2016). Therefore, systematic user input is needed; citizens should contribute their expertise and time to become co-creators of products and services, not just being customers.

Another perspective of citizen centricity arises from the discussion on transformational governmental programs (Kamalia & Nor, 2017; Weerakkody, Janssen, & Dwivedi, 2011). Organizations such as the United Nations (2012), or scholars like Dais et al. (2013), Borras (2012), Luna-Reyes, Gil-Garcia, & Celorio Mansi (2011) have also provided definitions of citizen centricity, but these have mostly focused on the design and delivery aspects of e-governments apart from viewing citizens as mere users. Evidently, fulfillment of the citizens' needs is of utmost importance. Citizen-centric demand models of transformational governmental systems comprise four elements,

namely openness, transparency, responsiveness, and participation (Kamalia & Nor, 2017). This framework was similar to the 4 pillars of e-participation of Erkul (2014) as cited by Vrabie & Tîrziu (2016).

It was claimed that this framework was holistic and articulated from the citizens' perspective, although this was not the case in reality. The above-mentioned study has only viewed citizens as users and urged the government to fulfill the citizens' needs. However, it has ignored the fact that citizens can also act as co-creators, or as democratic participants (Lim et al., 2017; Simonofski et al., 2017).

Citizen's characteristics
Earlier concepts of smart cities have considered citizens to be 'passive' recipients of services and beneficiaries (direct or indirect) of the activities in these cities (Castelnovo, 2016a). From our point of view, in the 1990s, people were not at the center of the development of smart cities although these were built to improve the quality of life (Babu et al. 2016). It is true that citizens have very few choices, if at all, to decide whether or not to participate in the smart cities' initiatives. However, they still have to constantly update their knowledge of the rapidly-changing technological applications, or risk being left behind. This situation has alerted some scholars of the early 2010s to redefine smart cities in such a way that citizens are given due precedence (Caragliu et al. 2009; Chourabi et al., 2012; Giffinger et al., 2007); Nam & Pardo, 2011). They have suggested certain orientations for the smart cities' initiatives. For example, Chourabi et al. (2012) mentioned that such initiatives should allow the members of the cities to participate in the governance, while Nam & Pardo (2011) reported a need to create communities in which all citizens can engage with each other more easily, effectively allowing them to develop a sense of ownership of their respective cities. These ideas have been accepted in policies such as Smart Barcelona and Smart London, following which the cities' governing bodies have perceptibly become more open-minded, citizen-friendly, and liberal, apart from involving more citizens in the delivery of projects. Thus, the role of the citizens has shifted towards 'active users' (Castelnovo, 2016b). In other words, they are allowed to provide information and can act as data providers or human sensors to assist cities to become smarter.

According to the literature on public administration, active roles of citizens were a relatively new occurrence, and these have been studied under the dynamic relationship between public administrators and citizens. (Callahan, 2007; Smith & Huntsman, 1997; Thomas, 2013; Vigoda, 2002). According Callahan (2007), these citizens' roles were not mutually exclusive; they could dominate one another at any given point in time.

Also, these desirable roles have mostly been demonstrated in the interaction between partnerships and cooperative forms of governance. Evidently, the aforementioned interaction was a common occurrence in deliberative or participatory democracies, but not representative or aggregative democracies (Vigoda, 2002).

We have selected five possible characters (or behaviors) and eight roles (or job titles) of smart city citizens. The former were 'active', 'independent', 'aware', 'creating public values', and 'educated'. As for the roles, citizen could become leaders, champions, co-producers, entrepreneurs, proposers, human sensors, volunteers, and experts. The definition for each term is provided in tables 1 and 2. As per the recent literature on public administration, characteristics like 'independence' or 'creating public values', and roles like co-producers or human sensors, were relatively new.

Table 1 Construct definitions for citizens' characters

Term	Construct Definition	Reference
Active	Active citizens participate in public life, where they take part, respond, care for each other, collaborate in exercising power, and make efforts to help, but not to interfere or leave something to happen by itself (i.e. in decision-making and execution processes). Suggested level*: Citizen power	Chourabi et al. (2012, p.2293) (also cited by Castelnovo (2016a, p.52 ; 2016b, p.101)); Castelnovo (2016b, p.102); Willems et al. (2017, p.250); Berntzen & Johannessen (2016a, p. 230); Alonso & Castro (2016, p.340); Morison (2007, p.142); Bovaird (2007, p.856); Vanolo (2016, p.33)
Independent	Independent citizens are democratic; they are self-decisive and free. They could have the right to choose and could have control over the data they generate. They are able to self-create resources and decide on the subjects that matter to them and their cities. Suggested level: Citizen power	Giffinger et al. (2007, p.11); Castelnovo (2016b, p.113); Morison (2007, p.146)
Aware	'Aware' citizens are well-informed with up-to-date information. They know what is happening in the system of the city and government from inside and also the surrounding competitions.	Giffinger et al. (2007, p.10, 18); Alonso & Castro (2016, p.341); Castelnovo (2016b, p.109-110)

	Suggested level: Citizen power	
Creating public values	This character is important in the sense that citizens take part in politics, voting, and voluntary work. They are involved in the chain of public services. These values are of the interest of the people, and can benefit the public or even future generations. Suggested level: Citizen power	Giffinger et al. (2007, p.22); Nam & Pardo (2011, p.287); Castelnovo (2016a, p.52); Castelnovo (2016b, p.108)
Educated	Educated citizens are those who are well-equipped with knowledge and are college graduates. They learn new skills and communicate through various channels. In Arnstein's ladder, 'educated' also means manipulated, cured, persuaded, and advised (by the power holders) in non-participation. Suggested level: Possible in all levels	Cardullo & Kitchin (2017, p.9); Winters (2011, p.254); Hughes (2014, p.1); Arnstein (1969, p.217-218); Castelnovo (2016a, p.54); Willems et al. (2017, p.254)

*Suggested level refers to the level of participation in Arnstein's ladder (1969)

Table 2 Construct definitions for citizens' roles

Term	Construct Definition	Reference
Leader (Synonym: decision-maker)	Citizens may act as leaders of local community organizations, in which they make decisions, distribute resources such as funding and human capital, as well as mediate between public organizations and individuals. They should have the qualities such as accountability, approachability, and decisiveness. Quality: to lead, decide, and mediate Suggested level*: Citizen power – between citizen control and delegated power	Arnstein (1969, p.221); Harrington (2017, p.1005-1006); Bovaird (2007, p.853, 855); United Cities & Local Governments (2016, p. 128)

Champion	Champions are citizens or community organizations who take part in meetings to stimulate common interest and bring about changes. They sometimes donate money to tackle local issues. Quality: to stimulate interest Suggested level: Citizen power – delegated power	Harrington (2017, p.1006); Baldersheim (2013, p. 19); Malaysian Communications & Multimedia Commission (2016, p.7, 79)
Co-producer (Synonym: co-planner, co-provider, co-deliver, co-manager, co-creator)	Citizens may act as co-producers in the chain of public services. They plan, cooperate, negotiate, manage, or deliver along with power-holders or service-providers. Quality: to negotiate or produce Suggested level: Citizen power – partnership	Castelnovo (2016b, p.109); Bovaird (2007, p.850, 856); United Cities & Local Governments (2016, p.59)
Entrepreneur	Entrepreneurs are citizens or social business people who wish to bring innovation to the community, apart from solving social issues and competing for better economic values. Quality: to innovate and compete (economically) Suggested level: Citizen power – partnership	Harrington (2017, p.1006-1007)
Proposer (Synonym: conscious data-provider, advisor)	Citizens may act as proposers, where they are able to suggest alternatives, make additions to proposals, facilitate feedback, and provide advice to plans. Quality: to suggest or advise Suggested level: Tokenism – placation	Willems et al. (2017, p.254); Cardullo & Kitchin (2017, p.6, 13)
Human sensor (Synonym: information provider/ data point)	Citizen may act as human sensors to make substantial resource (information) contributions to smart cities through their daily activities, in which data is created, shared, observed, and sometimes reported. This is a specific (not exclusive) role of the citizens, and the challenging part is to convert the unconscious human sensors to	Cardullo & Kitchin (2017, p.6); Berntzen & Johannessen (2016b, p. 6); Vanolo (2016, p.26, 33); (Castelnovo, 2016b, p. 109,113)

	conscious data-providers so as to protect their privacy. Quality: to create or share data Suggested level: Tokenism – between placation and consultation; or non-participation-manipulation	
Volunteer	Sharing and helping are considered as acts of volunteerism. Therefore, in smart cities' technological applications, citizens play a vital role as volunteers by contributing all kinds of efforts and support. Most importantly, they contribute their time without demanding for substantial monetary returns. Quality: to contribute time or effort Suggested level: Citizen power or tokenism	Harrington (2017, p.1010-1011); Berntzen & Johannessen (2016b, p.7)
Expert	Citizens may be experts in sharing their competence, experience, or knowledge. Quality: to share competence or experience Suggested level: Tokenism or non-participation	Berntzen & Johannessen (2016b, p.1)

*Suggested level refers to the level of participation in Arnstein's ladder (1969)

Participation in public life

The characteristics of the citizens, which have been proposed in the previous subsection, will be meaningless if the citizens do not wish to participate in matters related to public life (Cornwall, 2008). Public life refers to work that involves a lot of people and politics, engages in public services, as well as creates public values that benefit the communities and future generations (Castelnovo, 2016b). Participation in public life is one of the characteristics of Smart People, and is measured by involvement in voluntary work (Giffinger et al., 2007). According to Castelnovo (2016b), the most obvious way in which citizens can be said to participate in public life is by taking part in consultation exercises which support the city government in decision-making and planning processes. Thus, if a city were to be citizen-centric, the citizens themselves should take the initiative to associate themselves with public services, apart from contributing time and effort to do voluntary work.

Participation in public life is akin to involvement in a smart city initiative because the latter is for the benefit of all citizens (Lim et al., 2017). The issue with the current type of citizen participation is predominantly an indirect one, whereby institutions, businesses, and corporates are the primary stakeholders rather than the citizens or community (Willems et al., 2017). With respect to the ladder of participation proposed by Arnstein (1969), it has been further postulated that when smart city projects put more focus on 'placation' and 'partnership' (with corporates that possess greater organizational and technological capabilities), indirect citizen participation in the same will occur to a greater extent (Willems et al., 2017). Conversely, 'manipulation', 'therapy', 'informing', and 'consultation' provide a more direct focus on individual citizens. In other words, citizen participation in the public life of smart cities only happens at a lower level. In such cases, higher-level types of participation (e.g. 'partnerships with citizens' or 'dedicated power to citizens') seldom happen, and are frequently represented in an indirect manner.

If citizens do not directly participate in public life, then the level of democracy will be low as the citizens' right for access to public information is not being upheld. As such, emphasis should be placed on the 'process of deciding' (deliberative democracy) and not the 'framework for deciding' (aggregative democracy) (Morison, 2007). The difference between the two types is that the former attempts to realize democracy through newer approaches like negotiations, compromising, and two-way communications (Habermas, 1992), while the latter is based on a traditional framework in which those with power make the call, leaving the voice of the majority (i.e. the have-nots) to be subjugated or underrepresented.

Deliberative or participatory democracy, which is the preferred type, can be put into practice when there is full comprehension of the power of the citizens, who are at the upper level of the Arnstein's ladder of participation. This level consists of 3 elements, namely partnership, delegated power, and citizen control (Arnstein, 1969). The governments of smart cities (which also has started since the New Public Management era in 1980s) have invited private technological sectors to partner and deliver their services to the public. Examples include Cisco in Songdo, IBM in Barcelona (Hollands, 2015), Master Card in Cyberjaya (Gooch, 2017), and so on. However, the benefits of such public-private partnerships are highly questionable because the private sector is profit-oriented and capitalist in nature. In other words, the real benefits for the citizens might be not their main concern; rather, it could merely be a tokenism type of citizen centricity in order to secure projects from the government. Thus, we feel that there is a need for a deliberative type of democracy. Under this participatory paradigm, the

citizens should be the real partners of the government, and that the decision-making power should be conferred on the community.

METHOD

This was a qualitative study, in which experts have been interviewed for their opinions and ratings of the desirable characteristics of the citizens. We intended to seek feedback from experienced practitioners in contemporary smart cities because they were able to provide valuable opinions (both from an expert's and inhabitant's point of view). This measure was an attempt to conceptualize the characteristics of the citizens of smart cities and understand the hurdles in their participation in public life. This study was carried out during the 3-days Smart Selangor Conference 2017 (MBI, 2017). Selangor is the most developed state in Malaysia and has adopted the Smart State vision since 2015 (Fong, 2017; Smart Selangor Delivery Unit, 2016). As such, this Conference has invited international and local stakeholders of smart cities to get together and share new technologies, insights, as well as networks. Therefore, to understand the development of smart states or smart cities in Malaysia, the Smart Selangor Conference was definitely one of the important platforms.

The respondents, who were the invited speakers of the conference, were selected randomly by convenience sampling. First, we informed the organizers that we would be doing an academic study. The speakers would be interviewed if they were willing to, and if they were offstage or free. The international speakers represented global and local views, and were considered as key informants. They came from various countries and were involved in the development of the smart cities of their home countries, i.e. Amsterdam, Barcelona, Palo Alto, Istanbul, Kuala Lumpur, Jakarta, and Singapore. The data collection process was stopped when the respondent count was 8 as we felt that the answers have started to repeat, and the contents of the opinions have reached a saturation point (Ritchie & Lewis, 2003).

To facilitate the interviews, a semi-structured questionnaire has been prepared. It consisted of two parts, the first of which was on the demographic details of the respondents. The second part contained 7 interview questions on citizen centricity (1 question), citizens' characteristics (i.e. both characteristics and roles of citizens; 2 questions on a 7-point Likert scale ranging from totally disagree to totally agree), and hurdles of participation in public life (4 questions). The qualitative tools of Atlas.ti v.7.5.7 and Mendeley v.1.17.11 have been used to analyze the transcripts. In short, this

is a preliminary study of conceptualizing the citizens' characteristics and hurdles facing in smart cities.

FINDINGS

Demographics of the respondents

Of the 8 respondents, 7 were male and 1 female. Five were aged 41 to 60 while the other three 22 to 40. In terms of nationality, 3 were from Europe (1 from Amsterdam Netherlands, and 2 from Barcelona, Spain), 3 from Asia (1 each from Kuala Lumpur, Malaysia, and Jakarta, Indonesia; the remaining respondent declined to provide his/ her identity due to protocol restrictions), and 1 each from Palo Alto, United States, and Istanbul, Turkey. Half of the respondents had doctorate degrees and the other half Master's degrees. Five had 11 to 20 years of experience in smart city and e-government fields, while the other 3 had more than 20 years of experience. Four of them were in the public sector, 2 in private, and 2 in public-private partnership companies. All of them held important posts in their organizations; 5 were heads (or CEOs/ CTOs/ CIOs) while the others were strategy advisor, managing director, and senior assistant director respectively. All of them had different profiles, whereby 3 were serving in the corporate consulting department, 2 in the IT department, and the rest in the international relationship, planning, or engineering departments. As for the duration of interview, the shortest was 16 minutes and 3 seconds for Respondent 3 (or R3), while the longest 42 minutes and 36 seconds by R4. The mean duration was 30 minutes and 56 seconds.

Analysis on citizen centricity

R4 defined citizen-centric smart cities as cities which can shape the people's interests, for the people's best is. According to R8, the inhabitants of citizen-centric smart cities do not only bring up questions, issues, and complaints. Rather, they are also involved (participating) in the development of these cities by providing solutions and being aware of the surroundings. This statement was in line with Giffinger et al. 2007, who mentioned that citizen awareness is needed to shape smart cities.

Two interviewees (R6 and R7) have emphasized that governments of smart cities should ideally be inclusive when obtaining feedback. According to R6, while each citizen thinks differently, diversity and variety are the basis for democracy. In light of that, citizen centricity involves the consideration of all received opinions, some of which may contradict each other. Evidently, most of the respondents did not have a very clear idea of the concept of citizen centricity. Instead, they have described it in

general terms like putting people first, encouraging citizen participation (in the cities' development), and considering all feedback.

Analysis of citizens' characteristics
Two characteristics of the citizens have been analyzed, which were behavior (or character) and role (or post).

- **Citizens' Behaviors/ Characters**

In general, although the definitions of the terms have been provided, the majority (7 out of 8) of the interviewees felt that it was difficult to rate the characters according to importance, especially for 'independent' and 'creating public values' (refer Table 3). R4 mentioned that these characters are not mutually exclusive and depend on each citizen's experience perspective into smart city services. However, all of them agreed that 'active' was the most important character. According to R2, active citizens are very valuable partners. Authorities which simply make decisions on behalf of the citizens will result in a failure to activate the latter, and the decisions will not be well-received.

Citizen's behavior	R1 - Turkey	R2 - Netherlands	R3 - Malaysia	R4 - Spain	R5 - US	R6 - Spain	R7 - Asian	R8 - Indonesia	Average score
Active	7	6	7	7	7	7	7	7	6.9
Aware	6	7	7	5	7	7	6.5	7	6.6
Educated	7	4	7	5	7	7	6	7	6.3
Creating public values	7	4	3	5	2	7	5.5	7	5.1
Independent	6	5	5	7	4	7	5	5	5.5
Average score	6.6	5.2	5.8	5.8	5.4	7.0	6.0	6.6	

*Responses are based on a 7-point Likert scale ranging from totally disagree (1) to totally agree (7)
Source: on-site survey by the first author, 2017

Table 3: Citizens' behavior – ratings by importance

Well-informed citizens are needed for the healthy development of smart cities. As such, citizen awareness is more important than their level of education. It was mentioned by R2 that not all educated citizens are interested to contribute to a smart city's initiatives. Instead, well-informed citizens are more likely to do so. However, R4 argued that although active citizens are important, they hardly exist in reality. While the government desires to have more active citizens, the citizens themselves are usually too busy making their ends meet.

Most respondents did not feel that 'creating public values' was an important behavior of the citizens of smart cities because (1) people are generally self-centered (R3), (2) participation in public life is not of everyone's interest (R2), and (3) the creation of such values is an uphill task as these are naturally and culturally inherent (R5). According to R5, selflessness generally manifest in times of hardship like crises or disasters. For example, following the hurricane in Texas (Gonzalez, 2017), everybody came together to help each other despite the big diversity in the society.

In terms of independence, the majority of interviewees felt that citizens have to depend on resources provided by the government. R2 mentioned that citizens are intrinsically dependent on the authorities to provide more information on their daily lives. Meanwhile, it was claimed by R4 there is a possibility for community schools to be managed by the public without completely relying on the government. For example, a kindergarten facility is provided by the authorities, but is self-managed by the neighborhood via online platforms; the community takes care of all the children and equipment.

New characters like 'drive change' (by R1, R2, R4, R5 and R6) and 'empathy' (by R3 and R5) have surfaced along the interviews. The former is like an extended version of independence, except that the focus here is on the abilities of the citizens. Citizens can drive changes instead of only waiting for help from the government, according to R5. For example, in response to emergencies, citizen can actually take initiatives like disaster relief work to help others. Within compliance to the existing laws, the relief work could take the form of websites that identify the location of emergency supplies, or donated supplies and medicines. On another matter, R4, R5, and R6 have also stated that citizens can make a change through voting for their desired leaders in elections.

The second new character – 'empathy' – indicates the attempt to include all different voices and accept all differences in order to find better solutions to problems. R3 added that, a person who is competent and empathetic will recognize not only his/ her interests, but also that of others, hence leading to co-production.

- **Citizen's Roles/ Job Positions**
Next, we have analyzed the possible roles of the citizens of smart cities. Citizens can act as volunteers – the most desired role as per the ratings by the interviewees (refer Table 4). R5 was the strongest supporter of volunteerism. It is an act of altruism which involves the contribution of time and effort with little regard for compensation.

According to R5, the desire to participate and help without obvious benefits to oneself makes it the most important role of a citizen.

Citizen's roles	R1 - Turki	R2 - Netherlands	R3 - Malaysia	R4 - Spain	R5 - US	R6 - Spain	R7 - Asian	R8 - Indonesia	Average score
Volunteer	7	4	7	7	7	7	6.5	7	6.6
Champion	7	6	7	5	5	7	6	7	6.3
Co-producer	7	6	7	5	4	7	5	7	6.0
Proposer	6	4	7	5	5	7	6.5	7	5.9
Human sensor	5	6	7	5	5	7	4	7	5.8
Expert	6	4	7	5	5	7	6	7	5.9
Entrepreneur	5	1	7	5	5	7	5.5	6	5.2
Leader	6	4	6	5	4	3	3	7	4.8
Average score	6.1	4.4	6.9	5.3	5.0	6.5	5.3	6.9	

*Responses are based on a 7-point Likert scale ranging from totally disagree (1) to totally agree (7)
Source: on-site survey by the first author, 2017

Table 4: Citizens' roles – ratings by importance

Not many interviewees have elaborated on 'champion', but as per their ratings, most of them felt that local champions are important. On another matter, there were differing views for the co-producer role. R3 mentioned that it is possible to coproduce, but this is influenced by self-interest. For example, in Malaysia, a certain race or religion may be given priorities over others during the selection of co-producers. However, R4 supported the idea of co-production. According to R4, Barcelona is now focusing on co-management, whereby the government provides the infrastructure like neighborhood kindergartens, and allows the community to form committees and manage these facilities.

As for 'proposer', R8 described an occurrence in Indonesia in which village communities can come up with programs and apps to improve their neighborhoods. Through these, they can access governmental websites and, for instance, propose to fix neighborhood amenities like parks. Likewise, R6 – a private consultant – mentioned that citizens can propose ideas during meetings, and this counts for a lot in Barcelona's practices. The government will ask a consultant to get consent from the affected citizens before approving a project. However, the government has to be cautious when proposing projects because the citizens may have special interests.

Human sensors are associated with conscious or unconscious sharing of information or provision of data. From R4's perspective, citizens are not in favor of sharing data with the government, but they readily do so via social media like Facebook. Also, data-sharing is considered to be a characteristic of an active citizen. On the same note, R8 felt active sharing of ideas (through websites) by the community can result in the increased generation of solutions. An example by R7 regarding the effectiveness of human sensors revolved around the shopping trolley problem in Singapore.

The ratings for 'expert' ranged from 4 to 7; all respondents except R2 agreed that citizens can contribute their expertise and knowledge. In R2's opinion, 'entrepreneur' is not a favored role of citizens, as it is more suited to the private sector. Accordingly, R2 has rated 1 for 'entrepreneur' and 4 for 'expert'. On another note, R1 mentioned that citizens should take up various roles to make smart cities work.

The general view of the respondents is that citizens are not in an ideal position to lead all the initiatives of smart cities. Rather, they are suitable only to act as mediators that connect communities with the government. R6 opined that leaders should be politicians who have been elected. It is however interesting to note that in Barcelona, neighborhood leaders can eventually became councilors.

Analysis of challenges of participation in public life
Apart from agreeing that smart cities should strive to be more citizen-centric, the majority of the interviewees (R1, R2, R4, R6, R7, and R8) agreed that citizen participation is one of the methods to achieve the same. However, they have also highlighted the hurdles in the citizens' involvement in public life, especially with respect to character-building. The first challenge concerns the ways by which citizens should be activated? R7 felt that citizen-activation is an iterative process in which rapid action is required; there has to be a deeper understanding of the reasons for the passivity of the citizens. Although governments have a lot of channels to receive feedback from the public and understand their issues, there is still a lack of the 'how' and 'why' parts in the implemented solutions.

R2 has the similar response to the problem, i.e. conducting surveys and meeting up with the citizens is the solution. In Amsterdam, a survey is conducted every five years on 1 percent of the city's population. Eight thousand people will be invited to the community halls and interviewed to make sure that the public bring to light all the problems of the city. R2 added that face-to-face contact can significantly improve the people's willingness to cooperate.

The second challenge revolves around the shifting of the citizens' dependence on public resources to independence (self-creation of resources). For this, R2, R5, R6, R7, and R8 proposed that the citizens be asked elucidate their problem. R2 argued that a bottom-up approach - which includes talks and meetings with the citizens - can give rise to more independent residents. In other words, the aforementioned method invites the citizen themselves to define the problems prior to solving them. For example, the building of a new viaduct is not going to solve traffic congestion; instead, there should be a deeper analysis of the problem to come up with solutions like changing the peoples' working hours.

Nevertheless, R5 had a very different view from the others with regards to this challenge. According to R5, the aim is to cultivate more independent citizens who will be less dependent on the government. Additionally, there is insufficient governmental engagement with the people, hence raising the question as to whether the right things are being done by the former. As such R5 felt that the authorities should switch their focus on climate change (for example) to a more profound engagement with the community.

A challenge which is embedded in the two issues mentioned above is to make citizens believe that they can make changes in smart cities. For this, R2 proposed that more freedom be given to the citizens, apart from making them aware of the money- or time-saving properties of the changes made.

The third problem concerns the improvement of the direct participation of the citizens in public life. All the respondents agreed that public values were important. In fact, R1 supported the idea that an increase in the participation in public life will lead to more direct involvement in the development of smart cities. However, in order to promote their participation in the first place, there is a need to keep informing and educating the public. Likewise, R2 felt that it is extremely difficult to promote direct citizen participation since the predominant type of democracy nowadays is liberal representation. Though so, R2 still agreed that it is important for the government to take the lead.

The final challenge concerned the ambiguity as to whether the level of 'citizen power' in Arnstein's ladder (i.e. the rungs of partnership, delegated power, and citizen control), were ideal representatives of citizen centricity. R5 mentioned that there is currently no evidence to suggest that smart cities should strive for citizen control. However, citizen

power does exist in the form of government-citizen partnerships and resident empowerment. Also, R2 proposed that the focus should not solely be on achieving the state of full citizen power. Instead, the objective is to reduce the power distribution gap between the haves and have-nots. Likewise, R6 felt that the citizen centricity has to complement the authority of the politicians.

DISCUSSION

All aforementioned findings have contributed to a conceptual understanding of the formation of the concept of ideal citizen-centric smart cities, ideal characteristics of their citizens, and their ideal involvement in public life. Thus, further triangulation and verification on the general public would be carried out and tested in future studies to evaluate the feasibility of the proposed ideals.

Citizen centricity

As per the findings, it has been noticed that respondents did not have a very clear concept of citizen centricity. However, a few opinions – putting people first, listening to their feedback, and encouraging their participation in public life – were in line with the broad concept which was proposed by Undheim & Blakemore (2007); Berntzen et al. (2016); and Kamalia & Nor (2017). The opinions which differed slightly from the literature were that e-government services should be prioritized, and that citizens should be viewed as users. Meanwhile, the answers of the respondents have shown that they have considered citizens to be co-producers with public professionals, apart from being more responsible for and aware of the development of the smart cities, both of which were beyond the scope of e-government matters.

Citizens' characteristics

With reference to the analysis, the 5 characters (active, aware, educated, creating public values, and independent) and 8 roles (volunteers, champions, co-producers, proposers, experts, human sensors, entrepreneurs, and leaders) of the citizens have been rated by the interviewees. One of the respondent who stressed that all above-mentioned characteristics were not mutually exclusive, is aligned with Callahan (2007). After all, the action of rating do provide shade light in comparing and prioritizing these characteristics. Comparisons between the older literature on public administration with the current literature on smart cities, apart from the attempts to redefine the possible roles of the citizens (Cardullo & Jitchin, 2017), have revealed that these characteristics were not totally new, but were rather disruptive in the sense that these characteristics have not been made prevalent in the traditional paradigm of aggregative democracy. The relatively newer characters (i.e. independence, creating public values, as well as

being co-producers and human sensors) have possibly existed in the relationship between partnership and cooperative citizen-government interaction prior to the acceptance of the participatory forms of governance and deliberative democracies (Vigoda, 2002). As such, it is believed that we have elucidated the external factors of the citizens in the understanding of citizen centricity since the literature has mostly focused on the internal institutional factors (Berntzen et al., 2016; Kamalia & Nor, 2017; Undheim & Blakemore, 2007).

Among the 5 characters, we would like to further discuss 'aware'. Although it was ranked second in terms of importance, it was the most controversial character. In reality, from the government's perspective, well-informed citizens are most needed, but such citizens need to be created by providing them with relevant information. However from the viewpoint of the private sector, poorly-informed citizens are preferred so that new technologies can always be introduced and the end users subjugated. Yet again, current governments are more inclined to partner with the private sector rather than the community. Thus, the creation of well-informed citizens who are directly involved in the activities of smart cities is a gargantuan task (Willems et al., 2017). Hence, we believe that the solution should focus on co-production in the chain of public services (Bovaird, 2007; Castelnovo, 2016b).

As per the interviews, we have also discovered two new characters: 'driving change' and 'empathy'. We concur that citizens have the ability to drive changes in smart cities, provided that they are aware of the happenings within and around the cities (Giffinger et al., 2007). Also, through frequent meetings or surveys, citizens will be more informed of their problems. In turn, they will have knowledge of the correct solutions, i.e. those that really suit them. This kind of change is related to citizen-sourcing whereby citizens help the government to be more responsive and effective (Linders, 2012). They influence the direction and outcomes of the policies, improve the government's situational awareness, as well as help the government execute services on a day-to-day basis.

The 'empathy' character has been mentioned but hardly explained in the literature on smart cities (Lee et al. 2016; Thomas et al. 2016). Empathy is a human quality which accepts differences (in opinions, interests, or problems), observes, and sympathizes. It may be related to a kind of awareness that is attained through self-tracking (En & Pöll, 2016). However, we agree that this character is important, and that further exploration of the same is needed in the future.

In fact, with respect to our classification, if a behavior (action) can be turned into a 'job' or 'post', it would have been categorized as a role rather than character. Two cases will be presented to explain this. First, the sharing of information or providing of data is an action that is becoming more important in smart cities, and this can be further developed to become a 'job', which we have classified as 'human sensors' (which also includes terms like 'information-providers' or 'data points'). Second, actions such as co-producing, co-creating, and co-managing also have a big possibility to be developed into a 'job' in the future, which we have termed as 'co-producers' (Table 1 & 2).

With reference to the analysis of the 8 job roles, we felt that most respondents did not agree that citizens should be entrepreneurs and leaders. Thus, we have decided to drop these two from the list. Although the 'entrepreneur' role was proposed by Harrington (2017), we are of the opinion that it is more appropriate for the private technological sector. Furthermore, this role also contains values which contradict the aim of creating more public values in citizen-centric smart cities. As the term 'leader' is largely related to politicians, 'champion' appears to be a more suitable term to refer to the mediators between the community and government.

Challenges

As for the challenges, the interviewees have come up with possible solutions. First, regarding the activation of citizens, the authorities should meet with the citizens in person and take care of their needs. This face-to-face communication is found effective in increasing the likelihood of cooperation (Bornstein, 1996; Ostrom, 1998). Second, the shifting of the citizens' behavior from dependence to independence calls for the citizens to voice out their problems and lead certain community initiatives (through the creation of applications). In this matter, the government should also adopt bottom-up approaches. These measures are in line with the proposals by Castelnovo (2016b) and Bovaird (2007), whereby the government needs to trust and take risks in co-producing with citizens. Through this process, citizens will gradually learn and become more independent, which is a healthy sign for smart cities.

The respondents have come up with the question of how citizens should be made to believe that they can make changes in smart cities. The proposed solution for this was to give more freedom to the citizens and make them realize the benefits of driving change (such as increased savings or reduced pollution, both of which improve the quality of life).

The citizens' participation in public life can improve their direct participation in the initiatives of smart cities via awareness of the importance of creating public values. We strongly suggest that the citizens should be openly informed and educated on these issues because a deeper understanding of their roles in a deliberative democracy setting will allow a more direct type of participation to evolve.

The last challenge concerned the Arnstein's citizen control state, which is ideal for representing the direction of citizen-centric visions. The adoption of Arnstein's idea (i.e. sharing and distributing of power to the citizens) is good. However, full citizen control is not realistic, and we agree with Morison (2007) on this. Thus, in our opinion, the attainment of the level of citizen power in Arnstein's ladder (i.e. only the stairs of partnership or delegated power but not citizen control) is ideal for citizen centricity. Besides, we also agree with one of the interviewees who mentioned that there should be a focus on closing the gap between the haves and have-nots rather than citizen control.

CONTRIBUTIONS AND LIMITATIONS

This study has filled the knowledge gap of the characteristics of the citizens, and that of the hurdles in their participation in the public life of citizen-centric smart cities. It has contributed (and answered the first research question on the newer characteristics of the citizens) to the conceptualization of the relatively newer and ideal characteristics of the citizens. For example, instead of being passive data users or beneficiaries of services, citizens can actually be active and independent participants of public life, co-producers of public values, as well as human sensors who drive changes through deliberative democracy. Besides, this study has also provided suggestions to address the challenges in the citizens' participation in public life of smart cities. Examples include the adoption of effective face-to-face interactions, encouragement of citizens to voice out their problems, provision of more freedom to the citizens in leading certain initiatives, exhibition of open-mindedness when informing and educating the citizens, as well as adoption of Arnstein's idea of citizen power. The limitation here was the mutually-exclusive states of the characteristics (Callahan, 2007), whereby in reality, both citizens and public professionals would find it difficult to act accordingly to achieve the objectives.

The answer to the second research question was that the focus on more direct participation should be at the Arnstein's rungs of partnership and delegated power (but not citizen control), in view of the fact that the citizens of London had an indirect type of participation (Willems et al., 2017). Also, the focus should be on the closure of the

gap in the power distribution between the government and citizens (Callahan, 2007). The limitation here could be the difficulty in striking a balance in order to make both sides feel comfortable whereby the citizens feel empowered while the public administrators do not feel threatened.

In terms of governmental awareness and acceptance of the a more dynamic relationship between partnerships and cooperative type of government-citizen interactions a more direct type of citizen participation might be possible in the future. The realization of this scenario has been advocated by political science theorists (Bornstein, 1996; Ostrom, 1998) and participatory theorists (Callahan, 2007; Denhardt & Denhardt, 2007). Furthermore, we have argued that the objectives and success of citizen-centric smart cities were heavily reliant on a strong understanding of the characteristics of the citizens and their direct participation in public life. As such, the adoption of a participatory paradigm might be able to support the successful creation of citizen-centric smart cities mainly through public awareness and acceptance of these values.

As for the interviews with the experts, a total of seven suitable citizen behaviors have been identified (active, aware, educated, creating public values, independent, driving change, and empathy). Also, six important citizen roles have been enumerated (volunteers, champions, co-producers, proposers, experts, and human sensors). Although the opinions of the experts were valuable, there were limitations in the methodology of interviews. For example, the selection of different experts might give different results because their opinions were subjective.

CONCLUSION

With reference to the literature and interviews, we have come to preliminary conclusion that citizen centricity is a new agenda in the development of smart cities, and the it needs to be urgently addressed. Explorations into the characteristics of the inhabitants of citizen-centric smart cities are considered to be an early stage of the development of smart cities. This study has only focused on participation, so the topics which have yet to be explored are (1) the role of co-production in the chain of public services in smart cities, (2) the methods for measuring empathy or public values, (3) the importance of deliberative democracy in smart cities, and (4) the creation of a system that takes into account all opinions. In this study, as the characteristics of the citizens have only been conceptualized through the literature and interviews, further triangulations or verifications are needed to establish and fine-tune the same. To that end, we will use this conceptual framework and continue surveying the stakeholders in terms of their

involvement in the initiatives of smart cities, apart from considering a new combination of the characteristics of the citizens in these initiatives.

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