Analysing Collaborative Environments in Smart Cities

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ABSTRACT[1]

This paper seeks to analyse the use of new technologies by city governments in smart cities with the aim at improving e-participation of the citizenry in the public arena. To achieve this aim, this paper performs an e-survey sent to leading European smart cities about the relevance of collaborative governance in strategies of cities, the main pillars and outcomes of smart governance and the model of participation in developing a smart city. Also, an examination of 47 local governments of smart cities included in the working group of "creative citizenship" in the EUROCITIES network is performed during May 2017 with the specific purpose of collecting data about smart technologies used for e-participation. Findings indicate that, although relevant, less than 50% of sample smart cities have created citizen participation platforms to promote citizen involvement in public affairs and only a few of them promote online public consultations, discussions and petitions.

CCS CONCEPTS

• Social and professional topics → Government technology policy

• Applied computing → Computing in government → e-Government

KEYWORDS

Creative Citizenship; Collaborative Governance; Smart Cities

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1 INTRODUCTION

Nowadays, city governments are increasingly facing complex socio-technical problems and in response have developed strategies that rely on sophisticated information technologies (ICTs) in creative and innovative ways [15, 7]. These strategies are mainly rooted in democratic theory and revolve around processes of deliberation and on-going dialogue between institutions and the public they serve [1]. Indeed, the central spirit of smart cities is the need of building structures based on the negotiated involvement of multiple public and private stakeholders [36, 37] with the aim at creating public value.

The emergence and relevance of these ideas regarding the creation of public value and the need of citizen involvement in smart cities introduces a substantial change in the management of the city and the need for creating new and innovative forms of governance based on the concept of network governance [39]. Civic participation is a main way of transforming government to make it open and closer to the citizenry needs and it has been told to be a main objective within the context of smart cities and the smart cities movement [38].

As citizen participation is an umbrella term for multiple types of participation -seen as a kind of e-participation metamodel [52, 56]-, in this paper, active participation is defined as the possibility of enabling citizens to be much more directly informed and involved in decision-making -participatory governance [53]-, whereas open participation is referred to the opportunity of all stakeholders to participate in the city governance.

According to [15], active participation of citizenry in smart cities is necessary to create a sense of ownership and commitment, local level coordination to ensure the integration of solutions across the portfolio of initiatives and participation of local governments in networks to share knowledge and experiences. In brief, smart cities have really become in relational networks of actors, and the interaction among these urban actors constitutes urban governance. It highlights the process of coordinating and steering the urban society toward collectively defined goals [34].

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This way, it seems that there is no doubt that e-participation tools are one of the most prominent attributes of e-democracy [25]. In this regard, tools like the creation of transparency websites, open data platforms, e-participation platforms or the use of social media platforms could be relevant for helping governments in smart cities to build spaces for collaboration and participation in the city management. Online participatory platforms can in fact serve as tools helping both citizens and institutions sustain a continuous dialogue, share knowledge and competences, and foster collaborative processes [49].

The analysis of the use of social media platforms have been extensively analysed by prior research, much of which have concluded that city governments far from using them to promote the participation of citizens in public affairs, usually use these technological applications as other means of communication, mainly linked to promote cultural events, tourism in the city or, even, as a city branding strategy –representation strategy- [39, 40]. According to prior research, this behaviour is perhaps due to the opportunities that social media present to make municipality news available to the citizens increasing their audience reach at very little cost, and only changes in leadership and policy could make social media to be used for open governance to the fullest [4].

By contrast, up to now, there is a lack of research regarding the analysis of the relevance that smart cities associate to collaborative governance models as well as whether smart cities are using transparency websites, open data platforms or e-participation platforms to promote the citizen involvement in the public affairs of the city. In this regard, the EUROCITIES network brings together the local governments of the Europe's largest cities and one of the main focus areas aligned with the European Union's strategies priorities is to provide a strong strategically operational framework for building creative citizenship [12]. This way, EUROCITIES network is promoting creative citizenship for engaging and empowering citizens to help make their cities 'smarter' [12].

Therefore, this paper is framed under the relevance of collaborative governance models in smart cities that are members of the EUROCITIES network and are involved in a working group about "creative citizenship" and seeks to analyse the perception of representatives of these smart cities regarding the need of introducing collaborative and participative governance models and the use of new technologies by their city governments with the aim at improving e-participation of the citizenry in the public arena.

The remainder of this paper is organised as follows. The next section deals with the topic of creative citizenship in smart cities. Then, an empirical research is performed in smart cities included in the working group of "creative citizenship" into the EUROCITIES network seeking, on one hand, to collect the perceptions of smart city practitioners of these cities regarding the need of collaborative models of city management and, on the another, to know the experiences of these cities about the use of technological tools for promoting the involvement of citizens in city management. Then, conclusions and discussions bring the paper to an end.

2 CREATIVE CITIZENSHIP IN SMART CITIES THROUGH COLLABORATIVE GOVERNANCE MODELS

In the last decade, as a result of the economic crisis, new forms of city management have taken place with the aim at working with civil societies in order to co-create solutions to local challenges. Citizen involvement in the city management has become central in the smart city definition and its implementation increases the democratic participation of people in city government and therefore to create higher consensus and a better quality of life in a social sense [9]. It means the need for creating new and innovative forms of governance based on the concept of network governance and the need for fostering citizenry to participate in this city governance [39].

Indeed, with the advent of ICTs, attention is increasingly being placed on the potentials of digitally mediated social networks and communities [28]. Online communications have enabled individuals and small groups of individuals to engage more frequently, deftly and in greater depth with many types of organization. Also, it has allowed engaging smaller cities in this new phenomenon of citizen participation in public affairs and it has been told that smaller communities often possess their own powerful sense of place and identity, which helps in obtaining consensus and collaboration [5].

This way, cities that mandate people from different expertise, backgrounds, and walks of life to talk and listen to one another generate new perspectives and problem-solving capacities [22]. This builds smart cities with transparent and compact governance that should also help to create a public realm. Therefore, whether pessimistic or optimistic about the health of civic life, whether interested in traditional or new types of civic involvement, whether focused on participation in individual or group settings, discussions of civic engagements exhibit a particular investigative tendency [3].

Based on these pillars, prior research has indicated a link between open government and citizen participation [59], because open government could be considered as a policy agenda that looks towards models of deliberative democracy and collaborative governance [50] and pays strong attention to the role of digital technologies in democratic processes [51]. In this regard, one of the implicit assumptions of democratic innovation is that a more active and massive citizens' participation is not only desirable, but that it constitutes the essential dimension so that a democracy can respond effectively to what we commonly call democracy or, in a more precise way, it can be consistent with the normative definitions of democracy [51].

This way, a new concept that has become relevant in the last decade is that of creative citizenship. The concept of creative citizenship has been discussed in a variety of disciplines such as political communication, management studies, media studies, cultural studies and history [48, 28] and it offers direct association with technological innovation and communal interaction [26]. In fact, creative citizenship enables individuals to engage and to act, alone or with others, in new and creative endeavours made possible and enhanced through technological

innovation. This is relevant in smart cities. A recent research in smart cities has concluded that implementing an open innovation perspective is considered more important than obtaining specific innovation results [18]. Therefore, under this framework, creative citizenship could generate value by co-creating public services and increasing quality of life into smart cities, since citizens are involved in city management taking decisions to make all public initiatives directly citizen-centric.

Creative cities engage different kinds of knowledge, and encourage widespread public participation to deal imaginatively with complex issues. In their decision making they value holistic thinking, and act on the interdependence of economic, social, environmental, and cultural goals [5]. So, the creative city model implicitly removes responsibility from local and state governments for social welfare and economic restructuring [27]. Articulated in this manner, the concept of creative citizenship appears to be more helpful in guiding politicians toward the key features associated with acts of creative citizenship that have real contemporary resonance within specific policy arenas [26]. Under this meaning, creative citizenship is intimately associated with inter-action and co-creation, and it has the capacity to build and support community [26].

This way, the new citizenship into smart cities is built on the fourth view of this concept by [19] and [31, 32], which is focused on participation in decision-making in all aspects of life. Indeed, a smart city is a city that emerges like an innovation ecosystem [10], and intensive civic participation is an essential ingredient of radical and sustainable innovation [17]. Nonetheless, citizens will only be willing to get involved in implementing new insights and solutions if their voices have been heard during the development stage [23]. This way, [46] indicates that future belongs to the smart city, but only if a responsible government ensures a fair and level playing field in which all free citizens can act with economic and social freedom. So, smart cities should opt for a bottom-up approach to innovation, strengthening connections and embracing and encouraging the creative friction that results from this [23].

Despite previous comments, up to now, prior research has not analysed in an empirical way this issue in smart cities. Therefore, it could be interesting to analyse whether representatives of creative smart cities are aware of the need of introducing collaborative and participative governance models and also whether these smart cities are truly introducing new technologies with the aim at improving e-participation of the citizenry in the public arena. This is the research that this paper performs in the next sections.

3 DATA AND METHOD

3.1 Data collection

The data collection of this paper was performed using two different data collection methods. The first one is based on a questionnaire about smart governance and models of participation in smart cities that was sent to all representatives of local governments labelled as "smart cities" that are members of the EUROCITIES network and are involved in a working group about "creative citizenship". EUROCITIES network was founded in 1986 (formally in 1991) as the group of cities that was driven forward by three key factors: a clear urban focus; sharp political thinking; and existing relationships with the European Community institutions. The commitment of the cities to promoting an integrated urban model in Europe led them to set up ad hoc working groups on economic and social themes.

Nowadays, EUROCITIES network is composed by the elected local and municipal governments of over 130 of Europe's largest cities and 40 partner cities, which between them govern 130 million citizens across 35 countries (see http://www.eurocities.eu/eurocities/about_us). The network is headquartered in the Brussels office and its day-to-day work is conducted through six thematic forums and a number of related working groups in which our members can participate. Only the full members and associate members of the EUROCITIES network have access to participate in any of the EUROCITIES forums and working groups.

The objective of EUROCITIES network is to reinforce the important role that local governments should play in a multilevel governance structure, and currently is promoting city members the translation of smart cities into the broad political area [13]. In addition, EUROCITIES network's strategic framework 2014-2020 [13] sets out five focus areas to guide the work on these cities, which largely align with the EU's strategic priorities. This way, as a result of their partnership with the European Committee of the Regions (CoR) and the European Commission DG Employment, Social Affairs and Inclusion, member cities of EUROCITIES network are also very successful in securing funding to become smarter cities under the Horizon2020 smart cities and communities' lighthouse call for proposals. In fact, members of EUROCITIES network have access to a strong team of European policy, projects and funding experts in the Brussels secretariat of the network. Also, the areas of the EUROCITIES network's strategic framework are developed through seven thematic forums, a wide range of working groups, projects, activities and events. Forums monitor developments in specific policy areas, addressing issues and coordinating activities. They also set up and monitor working groups, and draft EUROCITIES position papers. Each forum meets two to three times each year and elects its own chair and vice chair.

Although the EUROCITIES network is a good playground for research in smart cities, it also a centre for European cities to make politics since its fundamental purpose is to shape European policy and support the demand of local governments to be heard at European level [11]. This way, this network promotes city authorities to be meaningfully involved in shaping the policies and programmes. Thus, EUROCITIES network is hugely valuable to any small or medium sized authority looking to become an established international player because this network can be seen as a lobbying body and as a unique platform from which the Council can seek to influence the key policy-making institution of the European Union [8].

According to [14], combining citizen participation and community engagement with digital technologies offers enormous potential for local authorities to better adapt to the

rapid technological, social and economic transitions by optimising the use of scarce public financial sources and finding better local solutions. So, this research is focused on smart cities that are labelled as full member and associate member and are actually involved in the working group of "creative citizenship" in the area of cooperation. The total sample selection is 47 cities that are members of EUROCITIES network (see http://www.eurocities.eu/eurocities/working_groups/Creative-citizenship&tpl=home). Therefore, the questionnaire was sent to these 47 leading smart cities in Europe and 16 responses were received (34,04% of sample smart cities).

The second data collection method is based on the exploration of sample smart cities official webpages in order to look the use of new technologies by city governments in smart cities with the aim at improving e-participation of the citizenry in the public arena. Concretely, taking into account that the "creative citizenship" working group of the EUROCITIES network is aimed at embracing and widening citizens' participation, exchanging knowledge and experience between cities on creative and collaborative ways to connect with their citizens and exploring how innovative methods can process civic engagement into positive and practical input for city, our paper explores whether sample smart cities have created official web pages for government transparency, open data or e-participation platforms.

Joining the two collection methods previously mentioned, this paper presents, on one hand, opinions and thoughts about the governance model to be implemented in the smart cities and, on another hand, experiences about tools used to achieve the aim that representatives of smart cites (smart city practitioners) have expressed in the survey.

3.2 Method

The first data collection method was administered through a follow-up online questionnaire, which included questions about the relevance of collaborative governance in strategies followed by smart cities, the main pillars and outcomes of smart governance and the model of participation in developing a smart city (see Table 1 in Annex). The questionnaire was translated into the different languages and was distributed to the sample smart cities, members of the EUROCITIES network. Also, a presentation letter was sent in which it was explained that for each of the items included in the questionnaire only one answer was allowed. Also, the presentation letter provided an email to ask for doubts about the questionnaire.

The questions were scored in 5 points Likert-scale with the aim of knowing the preference of respondents to each one of the items analysed (from "not at all important" to "extremely important" –see Table 1 in Annex-). Although the Likert-scale has some limitations [44], it was used in this research due to its suitability for attitude studies and the results obtained have proven be robust, reliable and valid [33, 29]. Also, a 5-point scale can alleviate the psychological distance between categories [47] and voids the need to draw inferences about differences in the underlying, latent characteristic, without this invalidating the conclusions drawn [33]. The results of this part of the questionnaire could help to characterize the importance of collaborative models of governance and the participation models in sample smart cities. Nonetheless, these results must be interpreted taking into account that our questionnaire collected opinions and desires of cities, not current practice or evidences. So, in order to know the current practice of sample smart cities, the second data collection method was based on an examination of 47 local governments of smart cities included in the working group of "creative citizenship" in the EUROCITIES network during May of 2017 with the specific purpose of collecting data about smart technologies used for e-participation (in the two main stages of an open government development for participation: information transparency and active participation).

A content analysis was conducted in each one of these websites to observe the presence, or not, of specific websites for e-participation and the issues that are dealt with into each one of the smart technologies analysed. As some websites are only performed in the official language of the city (different from English language), we have used Google translator to read them appropriately.

4 ANALYSIS OF RESULTS

4.1 Questionnaire results

Table 1 in Annex collects the responses of smart practitioners to the questionnaire in our research and shows the descriptive statistics of the responses obtained. As it can be seen in Table 1 in Annex, smart practitioners indicate that the most important strategies for realizing a smart city are the need of an integral vision of the smartness of the city and the need of introducing collaborative governance models in the city (both of them obtained the same frequencies, percentages, median and means scores –see items 1.4. and 1.5. in Table 1 in Annex-). Indeed, although relevant, smart practitioners think that an integral vision of the city is better than introducing individual policies for smart initiatives and projects (see items 1.2. and 1.4. in Table 1 in Annex). Also, although a smart city is not necessary built on the use of ICTs [6], all respondents think that the use of ICTs could strengthen the cities to become smart (see item 1.3. in Table 1 in Annex). In fact, governments have widely adopted ICTs with the promise of providing transparency, accountability and citizen participation in public affairs [16], which could help cities to become smart.

On another hand, prior research has indicated that legitimacy of governments in smart cities could be based on the need to support the management of the city on the content or on the process [30]. The first one is based on the achievement of smart outcomes (based on the ends), whereas the second one is focused on the process in realising these outcomes (based on the means: active engagement of citizens and stakeholders in urban governance). According to our results, smart practitioners have weighted both of them in a similar way (see items 2.1. and 2.2. in Table 1 in Annex), although a light preference for the process more than for the outcomes. This finding could be a strategy of local governments to improving legitimacy of governmental

actions (see responses to "extremely important" option in items 2.1. and 2.2. in Table 1 in Annex).

In addition, smart practitioners have pointed out the effect of smart governance over the efficiency of the administration as the main smart outcome to be produced in a smart city (see median and mean scores for item 3.7. in Table 1 in Annex). They think that the smart governance should make the city administration to become more efficient in all its actions (see item 3.7. in Table 1 in Annex). To achieve this aim, sample respondents indicate that smart governance should allow a greater interaction with citizens, which could help smart city governments to co-produce public services more oriented to citizens' needs (see items 3.2. and 3.5. in Table 1 in Annex).

Also, sample respondents have pointed out the economic growth as a main outcome of smart governance (see item 3.1. in Table 1 in Annex) but it could be considered as the result of the current economic crisis and the need to produce more wealth. Indeed, cities are becoming key actors in the global competition and they need to mobilize their resources to produce more wealth [24]. This way, results also highlight the need for collaborative governance models in smart cities (see items 4.1., 4.2. and 4.3. in Table 1 in Annex). In a general view, there is not clear evidence regarding the way of collaboration and participation in public sector management, although a light preference for selected stakeholder participation instead of open participation models is shown (see median and mean scores for item 4.2. in Table 1 in Annex).

In any case, it is clear that smart practitioners think that city governments should not be managed the city without the presence of ant way of participation of stakeholders. So, bureaucratic models of governance seem to have come to its end with the rise of smart cities.

4.2 Analysis of the new technologies used for improving e-participation

Table 2 in Annex shows the variables and method of evaluation used in our observation of official webpages of sample smart cities and Tables 3 and 4 in Annex collects the results obtained in the examination of 47 local governments of smart cities included in the working group of "creative citizenship" in the EUROCITIES network during May of 2017 with the specific purpose of collecting data about smart technologies used for e-participation (in the two main stages of an open government development for participation: information transparency and active participation).

Concretely, Table 3 in Annex shows the information collected regarding the information transparency in sample smart cities. Also, it collects the information of the existence of official transparency websites, open data platforms and e-participation platforms in all sample cities (Total and respondents, respectively) by administrative culture of the countries in which the cities are located. Results indicate that 36 of the 47 sample smart cities offer a transparency websites or open data platforms for information transparency (76,60% of the total population in our study -47 smart cities-). Besides, 3 of the 5 sample smart cities that offer transparency websites also provide open data platforms. Indeed, in general, it seems clear that open data platforms are more frequent in these smart cities (36 of 47 smart cities provide it).

Analysing the information transparency in the smart cities that have responded our questionnaire, 3 of them (18,75% over the respondents -cities of Barcelona, Munich and Venice-) offer both transparency websites and open data platforms, and other 9 smart cities offer only open data platforms (75% over the respondents).

In addition, the information format in which the information is disclosed is also relevant for information transparency [2, 43]. So, the use of an information format that can then be manipulated is essential in this case because municipalities could encourage more civic engagement among their citizenry by giving them access to information in formats that more easily engage them [2]. This way, the use of generally-accepted spread-sheet formats, such as JavaScript Object Notation (JSON), eXtensible Markup Language (XML), Microsoft Excel or Comma Separated Values (CSV) formats could be relevant for users to create their own reports. Moreover, text files, such as .pdf (Adobe Acrobat) are probably not so adequate for interacting with the information.

Our results indicate that the main information format used in both total population (47 sample smart cities) and smart cities that responded the questionnaire (16 of the sample smart cities) is the CSV format, followed by JSON format and XLS or XML formats. Therefore, it seems that sample smart cities are offering citizens the opportunity to collect raw data and to elaborate their own reports because these information formats allow the manipulation of the data according to the citizens' needs.

In addition, 8 of the sample smart cities offer only one of the information formats analysed in this paper (3 smart cities for respondents to the questionnaire -see Table 3 in Annex-). The rest of smart cities with open data platforms usually offer the information to be downloaded in two or more information formats analysed in this paper. Concretely, 2 smart cities offer the possibility to download the information in the 5 information formats analysed in this paper (only one respondent to the questionnaire -see Table 3 in Annex-), other 5 sample smart cities use 4 different information formats to disclose the information (2 smart cities for respondents to the questionnaire -see Table 3 in Annex-), other 13 sample smart cities use 3 different information formats to disclose the information (3 smart cities for respondents to the questionnaire -see Table 3 in Annex-) and, finally, other 8 sample smart cities use only 2 different information formats to disclose the information (3 smart cities for respondents to the questionnaire -see Table 3 in Annex-). In brief, results indicate that smart cities are promoting information transparency facilitating citizens the manipulation of the information disclosed.

By contrast, only 20 sample smart cities have a specific citizen participation platform website for public consultations, discussions or petitions to the local government of the city (6 smart cities for respondents to the questionnaire -see Table 4 in Annex-). In fact, less than 43% of the sample smart cities allow citizen to actively participate in public affairs (less than 38% of

the respondents to the questionnaire –see Table 4 in Annex-). Nonetheless, the most of them usually provide a specific link to contact with the government, either through web forms or through email addresses (42 of 47 for sample smart cities -89,36%- and 15 of 16 respondents to the questionnaire -93,75%-). Also, only 6 of the sample smart cities that offer a citizen participation platform website offer the possibility for citizens to make public consultations, discussions or petitions. By contrast, all respondents to the questionnaire that offer a citizen participation platform website also provide the possibility to contact with the local government. So, it seems that the contact with the government is a possibility that is always offered by those smart cities that foster active citizen participation in the municipality.

Besides, data indicate that most of the smart cities with a specific citizen participation platform website usually allow citizens to perform, at least, two of the main functions provided in these platforms (public consultations, discussions and/or petitions – see Table 4 in Annex-), although this possibility is higher in the total sample smart cities than in the respondents to our questionnaire (66,66% of the respondents accomplish this item – see Table 4 in Annex-).

In brief, analysing the results obtained in both over the 47 sample smart cities and over the 16 respondents to our questionnaire, data indicate that smart cities are promoting the first stage to transform a city government in an Open Government [20], because they are disclosing a great deal of information with the use of easily manipulated information formats through transparency websites and/or open data websites. Nonetheless, these smart cities are failing in facilitating the active participation of citizens nowadays.

5 DISCUSSIONS AND CONCLUSIONS

This research explores the perception of smart practitioners in smart cities included into the group of "creative citizenship" of EUROCITIES about collaborative governance models as well as the use of new technologies by their city governments with the aim at improving e-participation of the citizenry in the public arena. As noted by prior research, urban regimes are likely to emerge in a different way in different contexts. In fact, most theories of urban politics fail to properly conceptualize or explain patterns of urban governance because they are focused only on single-case studies [34]. So, findings of this research could be the result of the political, economic, and institutional context of each one of the sample cities members of EUROCITIES network. Future research could analyse e-participation models from a structured and focused comparative lens, with the aim at obtaining more analytical mileage [34]. In any case, this issue does not invalidate results obtained but it reflects the context in which the results are obtained.

In this regard, findings have confirmed prior research [41] because traditional hierarchical model of public administration seems not to work in the smart cities' framework. According to our findings, an integral vision of the city is better than planning smart individual projects to become a city smart. Indeed, a holistic engineering approach for e-participation systems analysis and design is necessary [54].

So, city governments must undertake strategic planning in the innovation and implementation of smart projects into the city and must collect the suggestions and opinions of all stakeholders in this regard. This way, collaborative and participative models of governance are the preferred models of governance to undertake smart projects in the city and local governments should facilitate the participation of all stakeholders in this process. Else, they could be deemed to fail.

Also, e-participation applications require proper design to support the involvement of citizens, politicians and other actors in political debates and strategic decision-making [55]. In this regard, a main challenge in smart cities is concerned with understanding how to design tools to facilitate online deliberation and support collaborative working environments. The use of online platforms engages citizens and encourages citizen participation in local government decisions. Citizens should have the opportunity to provide feedback on local government policies online. Nonetheless, according to our results, sample smart cities in our study and those that responded our questionnaire are not promoting active participation of citizens. Although these respondents usually enhance information transparency and indicate that collaborative governance models are the future of city management, they are not aware of the potential of online participation for citizens.

By using e-participation platforms, smart cities could gain feedback and helpful insights from users thereby enabling more informed decisions and better services to citizens. Indeed, e-participation platforms using open data and data visualisation techniques could facilitate collaborative and evidence based policy decision-making [57]. In this regard, although smart cities are not willing to allow citizens to be involved in city governance, our findings point out that they think relevant to make citizens participate in the co-production of public services, as [21] have recently demonstrated in the Japanese context. If so, it could be a good step for creating public value in smart cities because they are driven to provide citizen-centric services, which smart practitioners in our study have told that it is a main outcome for smart governance –(see Table 1 in Annex-). This trend is consistent with the core values of the open data movement: Innovation, collaboration, and participation [58].

In fact, our findings point out that the perspectives mentioned by [42] in public value creation fit well into the smart governance concept: the first one (outcomes) as an essential element and the second one (process) as a strategy for realizing smart governance. Therefore, the discussion between these two perspectives shows that the idea of a smart city can contribute to the public value creation through strengthening the outcomes (most importantly: not only wealth but also sustainability) but also through the process to creating it with more democratic forms of government (most importantly: not only representation but also direct citizen participation).

In this regard, findings indicate that the smart outcomes to be achieved by smart cities involve changes to government (more efficient government), changes in the position of government vis-à-vis other urban actors (citizen-centric services and

interaction with citizens) or improvements to the city (economic growth). These outcomes are considered main elements of the public value creation in the city and involved the need of stakeholder participation in city management (selected and open participation), which makes the city government to foster creative citizenship that could help to solve complex problems of the nowadays society.

In fact, wealthier municipalities, with a more prosperous and better-educated population, will be more aware of transparency and accountability issues [35]. So, it is time that citizens are prepared to participate in public affairs. Thus, a main challenge in smart cities is the movement from experimentation and pilots to large-scale usage of e-participation applications (scaling-up of e-participation projects) and, therefore, from selected stakeholders' participation to open participation of citizens.

In addition, recent research has demonstrated that whereas perceived usefulness is positively associated with platform behaviour of web users, technology acceptance model variables have not effect on users' activity [45]. Therefore, all levels of governments should take actions to promote and create a culture of citizen participation in public decisions. Citizens must be also smart and problems of digital divide should be solved in all cities. Indeed, smart cities must not only emphasize the role of ICT infrastructure, but also the role of staff training, human capital/education, social and relational capital, and environmental interest as important drivers of urban growth [6]. Therefore, technological access, learning spaces for citizens and transparent processes of taking public decisions could be good public policies with the aim at disclosing and recognising that citizen voices have been heard during the decision-taking process of the city government. Recent research has found that governments are able to advocate and educate their citizens by communicating electronically with them and thus change their behaviours and attitudes toward the society [16]. This way, it could help smart cities to increase legitimacy and commitment of citizens in public affairs [2, 23] as well as to evaluate and understand what goals have and have not been achieved. In fact, the reliable representation of the information and analysis of contributions made by civil society is another challenge to face in this new wave of smart cities.

We are aware that there are no standard definitions of effectiveness in e-participation in smart cities, nor should we expect any to emerge, but our findings point out that considering the early stage of maturity of investigated governance models in smart cities and e-participation technologies used for citizen involvement in public affairs, there is still potential for improvement, especially regarding the aspects of creative citizenship and active participation in this new framework. So, future research should tackle all these problems and explore the causes why citizens are not participating in cities where all aspects of open government are accomplished. This way, effectiveness in e-participation could be higher.

Also, future research could be addressed to analyse whether smart cities are promoting, or not, e-participation in a higher level than those cities that cannot be labelled as smart. This way, we could advance better in the definition of smart cities and in the axes in which they are built on.

In conclusion, sample smart cities grouped in the "creative citizenship" into the EUROCITIES network are usually prone to information transparency but do not generate virtual environments favouring fluid interaction between local governments and citizens. Also, although smart practitioners have responded our questionnaire with the indication that collaborative models of governance are necessary in smart cities, the real framework in these cities is that e-participation is not promoted. So, some research questions arise: are these smart cities in an early stage of development in the way for e-participation?; is the qualitative characteristic of "smart" only a branding image for the city?; are the citizens promoted and ready to participate in city management?; what are the incentives for citizens to participate with local governments?; in what conditions?. Future research could go further in the response to these questions unsolved.

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ANNEX

Table 1: Statistics and Results of the e-survey

Frequency and percentage of each one of the options												
Question/Options	Frequency											
	Not at all important	%	Low importance	%	Neutral	%	Moderately important	%	Extremely important	%	Total	%
Q1. How important are the following strategies for realizing a smart city?												
1.1 Legislation for stimulating smart city.	1	6,25	1	6,25	4	25,00	6	37,50	4	25,00	16	100,00
1.2. Policies for promoting smart city initiatives and projects.	0	0,00	0	0,00	1	6,25	5	31,25	10	62,50	16	100,00
1.3. Use of ICTs to strengthen smart cities.	0	0,00	0	0,00	1	6,25	6	37,50	9	56,25	16	100,00
1.4. An integral vision for a smart city.	0	0,00	0	0,00	1	6,25	4	25,00	11	68,75	16	100,00
1.5. Collaborative governance for a smart city.	0	0,00	0	0,00	1	6,25	4	25,00	11	68,75	16	100,00
Q2. Smart governance is governance based on ...											Total	
2.1. ... smart external collaboration and participation.	0	0,00	0	0,00	2	12,50	4	25,00	10	62,50	16	100,00
2.2. ... smart outcomes.	0	0,00	0	0,00	1	6,25	6	37,50	9	56,25	16	100,00
Q3. The main outcome that smart governance is to achieve is ...												
3.1. ... economic growth.	0	0,00	0	0,00	0	0,00	7	43,75	9	56,25	16	100,00
3.2. ... citizen-centric services.	0	0,00	0	0,00	1	6,25	4	25,00	11	68,75	16	100,00
3.3. ... social inclusion.	0	0,00	0	0,00	2	12,50	8	50,00	6	37,50	16	100,00
3.4. ... ecological performance.	0	0,00	0	0,00	1	6,25	8	50,00	7	43,75	16	100,00
3.5. ... interaction with citizens.	0	0,00	0	0,00	1	6,25	4	25,00	11	68,75	16	100,00
3.6. ... strong city brand	0	0,00	0	0,00	2	12,50	12	75,00	2	12,50	16	100,00
3.7.... more efficient government	0	0,00	0	0,00	0	0,00	5	31,25	11	68,75	16	100,00
3.8. ... highly educated citizens	0	0,00	0	0,00	4	25,00	7	43,75	5	31,25	16	100,00
3.9. ... readiness for disaster management	0	0,00	1	6,25	4	25,00	7	43,75	4	25,00	16	100,00
Q4. The model of participation in developing the smart city in your municipality is							**No**		**Yes**		**Total**	
4.1. Exclusively the municipality. No participation of other actors.							16	100,00	0	0,00	16	100,00
4.2. Selected Stakeholder participation.							7	43,75	9	56,25	16	100,00
4.3. Open participation.							9	56,25	7	43,75	16	100,00

Descriptive statistics of the responses to the e-survey								
Question/Options	Frequency	Mean	Median	Mode	Standard Deviation	Maximum	Minimum	Range
Q1. How important are the following strategies for realizing a smart city?								
1.1 Legislation for stimulating smart city.	16	0,69	1,00	1,00	1,14	2	-2	4
1.2. Policies for promoting smart city initiatives and projects.	16	1,56	2,00	2,00	0,63	2	0	2
1.3. Use of ICTs to strengthen smart cities.	16	1,50	2,00	2,00	0,63	2	0	2
1.4. An integral vision for a smart city.	16	1,63	2,00	2,00	0,62	2	0	2
1.5. Collaborative governance for a smart city.	16	1,63	2,00	2,00	0,62	2	0	2
Q2. Smart governance is governance based on ...								
2.1. ... smart external collaboration and participation.	16	1,50	2,00	2,00	0,73	2	0	2
2.2. ... smart outcomes.	16	1,50	2,00	2,00	0,63	2	0	2
Q3. The main outcome that smart governance is to achieve is ...								
3.1. ... economic growth.	16	1,56	2,00	2,00	0,51	2	1	1
3.2. ... citizen-centric services.	16	1,63	2,00	2,00	0,62	2	0	2
3.3. ... social inclusion.	16	1,25	1,00	1,00	0,68	2	0	2
3.4. ... ecological performance.	16	1,38	1,00	1,00	0,62	2	0	2
3.5. ... interaction with citizens.	16	1,63	2,00	2,00	0,62	2	0	2
3.6. ... strong city brand	16	1,00	1,00	1,00	0,52	2	0	2
3.7.... more efficient government	16	1,69	2,00	2,00	0,48	2	1	1
3.8. ... highly educated citizens	16	1,06	1,00	1,00	0,77	2	0	2
3.9. ... readiness for disaster management	16	0,88	1,00	1,00	0,89	2	-1	3
Q4. The model of participation in developing the smart city in your municipality is ...								
4.1. Exclusively the municipality. No participation of other actors.	16	0,00	0,00	0,00	0,00	0	0	0
4.2. Selected Stakeholder participation.	16	0,56	1,00	1,00	0,51	1	0	1
4.3. Open participation.	16	0,44	0,00	0,00	0,51	1	0	1

Table 2: Analysis performed in this Research. Variables and Method of Evaluation

Area of Analysis	Stages Analyzed	Items	Description	Type of analysis	Score
E-Participation	Information Transparency	Web of Transparency	Existence of a specific website for information transparency	Quantitative	0/1
		Open data Website	Existence of a specific Open data website for information transparency. Also, we analyze the format of the information uploaded on the website (pdf, xls, csv)	Quantitative	0/1
	Active Participation	Citizen Participation Platform	Existence of a specific citizen participation platform. Also, we analyze whether the platform is used for public consultations, discussions and/or petitions.	Quantitative	0/1
		Contact with the Government	Existence of a specific space for contacting with the government of the smart city.	Quantitative	0/1

Table 3: Transparency Websites and Open Data Websites in Total Population and Respondents to the E-survey.

	Total Population		Respondents to e-survey		Information Format					Number of SC			
	Number of SC	%	Number of SC	%	pdf	xls	csv	json	xml	Total Population	%	Respondents to e-survey	%
Transparency Websites	5	10,64	3	18,75	X	X	X	X	X	2	5,56	1	8,33
Open Data Websites	36	76,60	12	75,00	X	X	X	X		0	0,00	0	0,00
					X	X		X	X	1	2,78	0	0,00
					X	X	X		X	2	5,56	1	8,33
						X	X	X	X	2	5,56	1	8,33
					X		X	X	X	1	2,78	0	0,00
Information Format					X	X	X			1	2,78	0	0,00
pdf	13	36,11	4	33,33	X	X		X		1	2,78	0	0,00
xls	16	44,44	6	50,00	X		X	X		2	5,56	1	8,33
csv	27	75,00	9	75,00	X	X			X	0	0,00	0	0,00
json	19	52,78	7	58,33	X		X		X	1	2,78	0	0,00
xml	16	44,44	5	41,67		X	X	X		2	5,56	1	8,33
Total Cities with Open Data Websites	36		12			X	X		X	1	2,78	0	0,00
							X	X	X	4	11,11	1	8,33
					X	X				1	2,78	0	0,00
						X	X			1	2,78	0	0,00
					X		X			0	0,00	0	0,00
					X			X		0	0,00	0	0,00
					X				X	0	0,00	0	0,00
						X		X		0	0,00	0	0,00
						X			X	0	0,00	0	0,00
							X	X		4	11,11	2	16,67
							X		X	2	5,56	1	8,33
								X	X	0	0,00	0	0,00
					X					2	5,56	1	8,33
						X				3	8,33	2	16,67
							X			2	5,56	0	0,00
								X		0	0,00	0	0,00
									X	1	2,78	0	0,00
			Total Population		**13**	**16**	**27**	**19**	**16**	**36**		**12**	
			%		**36,11**	**44,44**	**75,00**	**52,78**	**44,44**				
			Respondents to e-survey		**4**	**6**	**9**	**7**	**5**				
			%		**33,33**	**50,00**	**75,00**	**58,33**	**41,67**				

Table 4. E-participation Tools used in Total Population and Respondents to the E-survey.

	Total Population		Respondents to e-survey		Aspects dealt with into the citizen participation platform website			Number of smart cities					
	Number of SC	% over 47 SC	Number of SC	%	Public consultations	Discussions	Petitions	Total Population	% Total	% over 47 SC	Respondents to e-survey	% Total	% over 47 SC
Citizen participation platform website	20	42,55%	6	37,50%	X	X	X	6	30,00%	12,77%	1	16,67%	2,13%
Contact with the local government	42	89,36%	15	93,75%	X	X		3	15,00%	6,38%	1	16,67%	2,13%
						X	X	3	15,00%	6,38%	2	33,33%	4,26%
					X		X	0	0,00%	0,00%	0	0,00%	0,00%
					X			4	20,00%	8,51%	1	16,67%	2,13%
						X		1	5,00%	2,13%	1	16,67%	2,13%
							X	3	15,00%	6,38%	0	0,00%	0,00%
			Frequency		**13**	**13**	**12**	**20**			**6**		
			% over 47		**27,66%**	**27,66%**	**25,53%**	**42,55%**			**12,77%**		