Noella Edelmann · Peter Parycek
Gianluca Misuraca · Panos Panagiotopoulos
Yannis Charalabidis · Shefali Virkar (Eds.)

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Electronic Participation

10th IFIP WG 8.5 International Conference, ePart 2018
Krems, Austria, September 3–5, 2018
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Preface

Welcome to the proceedings of EGOV-CeDEM-ePart 2018!

This year marks a milestone for the International Federation for Information Processing (IFIP) Working Group 8.5. The 2018 edition of the EGOV-CeDEM-ePart 2018 Conference represents the merge of the IFIP WG 8.5 Electronic Government (EGOV), the IFIP WG 8.5 IFIP Electronic Participation (ePart), and the Conference for E-Democracy and Open Government (CeDEM).

Held in picturesque Austria, and hosted by the Danube University Krems, the merger of the conferences heralds the creation of a unique platform where scholars and practitioners from around the world can come together to interact and deliberate on cutting-edge interdisciplinary, multi-methodological research within the domains of e-government and open government, e-democracy and e-participation, smart governance, artificial intelligence, data analytics and automated decision-making, digital collaboration and social media, policy modeling and policy informatics, social innovation, and open data, linked data and the semantic web. The papers submitted to this year's conference presents state-of-the-art research findings covering completed research, ongoing research projects, practitioner issues and perspectives, and critical viewpoints and reflections. The PhD colloquium consists of innovative student papers on topics addressed by the conference, giving young researchers the opportunity to both have their own research evaluated and to meet and engage with their peers and senior researchers.

This volume of the IFIP EGOV-CeDEM-ePart proceedings contains 12 full papers accepted to the "General e-Democracy & e-Participation" track, the "Digital Collaboration and Social Media" track, the "Policy Modeling and Policy Informatics" track, and the "Social Innovation" track.

E-democracy and e-participation might have matured as research domains, but the papers showcased at the conference present the very latest ideas and most innovative developments in these ever-expanding disciplines. For some authors, the focus is on the improvement of e-participation practice. Leif Sundberg develops a method for evaluating e-participation based on multi-criteria decision analysis. Andrei Chugunov and Yury Kabanov advance a framework, tested on 85 Russian regional e-participation portals, that considers institutional design and is compatible with large- and small-N analysis. Similarly, Dmitrii Trutnev and Lyudmila Vidiasova investigate the methods available for assessing the effectiveness of public information systems to create public values.

Other authors focus on the creation of opportunities for increased e-participation via the harnessing of digital media platforms. In a mixed-method study of all posts made on Israeli MPs' Facebook pages during the 2014 Israel–Gaza war, Nili Steinfeld and

Azi Lev-On explore how social media channels function as vehicles of e-participation during emergencies. Bert Groot and colleagues examine, through a review of the extant literature, the potential of urban media to reshape the role of citizens in urban planning. Lessons learned are contrasted with findings from expert interviews.

Further authors comment on developments in e-participation and e-democracy through case studies. Marius Rohde Johannessen looks critically at the emergence of social media as an important part of the Norwegian parliamentary election landscape – and the implications for democracy and the public sphere. The current status of e-participation in Kampala, Uganda, is elaborated upon by Norbert Kersting and Andrew Matsiko. The authors study the rise of localized online participatory instruments and their efficacy in creating spaces for bottom–up participation. The spotlight is also turned on Mexico City, where Rebecca Rumbul and colleagues explore the application of digital technologies to combat vulnerabilities in processes of participatory budgeting.

Elsewhere at the conference, the focus is on social media and – more broadly – the nature of digital collaborations within public organizations and across governance networks. Within this context, Sara Hofmann and colleagues critically examine the role that the public sector might play in the modern-day sharing economy based on collaborative consumption. Their review focuses on the main stakeholder groups that the public sector has to interact with in collaborative consumption applications, namely, the customers, service providers, and platform providers.

Papers in the "Policy Modeling and Policy Informatics" track concentrate on how public policy making might be supported through the application of innovative ICT and by involving relevant stakeholders. Jasmine Riedl critically describes the creation of a comprehensive database containing the time-strategic actions of political actors to facilitate the analysis of the temporal dynamics of the German legislative process. In their paper, Aggeliki Androutsopoulou, Yannis Charalabidis, and Euripidis Loukis develop a maturity model to explain how crowd-sourcing through social media can be harnessed by government to support policy-making, based on an assessment of different existing approaches and methods.

Social innovation is not a new concept, but recently it has been gaining ground in policy and academic circles. An increasingly favorable environment for development and experimentation – a direct consequence of technological and organizational innovation – it is seen as able to address critical societal challenges such as unemployment, disparities in access to healthcare, and mass migration. Here, Gianluca Misuraca, Giulio Pasi, and Gianluigi Viscusi seek to broaden our understanding of the social implications surrounding digital transformation through an analysis in their paper of four case studies that focus on the role played by social innovation in the fostering of resilience within societies.

The ideas and concepts advanced in these proceedings push the boundaries of conventional wisdom and scholarship, and we anticipate that the volume will be an interesting and thought- provoking read. In conclusion, the editors and track chairs would like to thank the authors for their submissions to the proceedings; but also all those individuals who contributed their time and effort towards making this conference

a resounding success – the members of the Program Committee, the reviewers, the conference participants, the organizing team, and the local hosts at the Danube University Krems.

September 2018

Noella Edelmann
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Organization

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General E-Democracy and E-Participation

Shaping up e-Participation Evaluation: A Multi-criteria Analysis

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Abstract. E-Participation is the use of internet-based technology to empower and include citizens in government decision making processes. The United Nations has evaluated e-Participation around the globe on a regular basis. This evaluation has been criticized for not corresponding to reality, thus allowing non-democratic regimes to gain high positions simply by offering web services. Against this backdrop, the purpose of this paper was to develop a method for evaluating e-Participation, which takes into account a nation's democratic system. Multi-criteria decision analysis was utilized to create a new index by combining datasets of democracy and equality with the UN e-Participation Index 2016. In the new index, authoritarian regimes have lower ranks, and it performed better than UN's index when testing it towards perceived corruption. The paper concludes by suggesting that the proposed method should be accompanied by indicators of the actual use and impact of e-Participation processes. The results of this study contribute to the improvement of e-Participation evaluation practice by introducing normative criteria of good governance.

Keywords: e-Participation · Evaluation · Democracy · Equality
Multi-criteria analysis

1 Introduction: e-Participation Evaluation and Democracy

E-Participation is the use of Internet-based technology to include and empower citizens in government decision making processes. Although e-Participation is associated with the hope that new technology can enhance democracy and contribute to 'better' government, the impact on, for example, policy making has so far been limited [1].

As a research field, e-Participation is characterized as multidisciplinary, in that it brings a variety of methods and scholars together [2, 3]. Although there is no unified theory in the field, researchers have made attempts to characterize the field and set out paths for further research. Medaglia [4] argues that e-Participation research needs to move beyond technology to focus on citizens and other stakeholders. Grönlund [5] contends that the current models for describing progress in e-Participation are based on the extensive use of technology and the idea that direct democracy is the most advanced form of democracy.

Other scholars focus on success factors for good e-Participation practice. Jho and Song [6] argue that e-Participation will fail, or even be a menace to democracy, if only technological infrastructure is considered: technology needs to be accompanied by

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appropriate institutional conditions. Molinari [7] contends that five attributes are crucial to achieving sustainable participation: juridical compliance, legitimacy, social value, efficiency, and productivity. An Austrian case study concludes that to prevail with e-Participation, the users' specific characteristics must be taken into account, including age, skills, and gender [8]. Skills and gender are also identified as determinants for e-Participation in the Spanish context by Vicente and Novo [9].

The United Nations evaluates e-participation every other year through the UN e-Government Survey (UNES2016) [10]. However, the UN evaluation has been criticized for not taking contextual factors into account, thus allowing non-democratic regimes to gain high positions simply by publishing services on their websites [11]. Linde and Karlsson [12] reveal that positive development in e-participation in non-democratic countries does not lead to positive effects on reducing corruption and quality of government. Karlsson [13] contends that non-democratic states with high levels of e-participation also utilize strategies for controlling citizens' internet use. Gulati et al. [14] show similar findings, suggesting that authoritarian regimes might utilize e-Government to maintain status quo. Maerz [15] argues that authoritarian regimes utilize e-government to demonstrate modernity and legitimacy, as well as gaining internal legitimacy by pretending to increase transparency and citizens' engagement. Åström et al. [16] contend that economic globalization is a strong predictor for e-participation development in non-democracies: by implementing ICT-infrastructures, countries make themselves attractive alternatives for foreign investments in technology. Kneuer and Harnisch [17] criticizes the UN surveys for not taking the nations' motives and strategic purposes of e-Government into account. Sæbø et al. [3] contend that e-Participation evaluation is dependent on articulated objectives, clear democratic ideals, and criteria that can serve as benchmarks.

Against this backdrop, the purpose of this paper is to develop a method for evaluating e-Participation that takes into account a nation's democratic system. The paper proceeds as follows: Sect. 2 describes the data and research procedure. In Sect. 3, the results are presented and, finally, conclusions, limitations and implications for further research are described in Sect. 4.

2 Methods and Materials

A point of departure in this research is the UN e-Participation Index, which is part of the UNES2016. As literature has pointed out the importance of appropriate democratic institutional conditions in e-Participation initiatives, the Economist Intelligence Unit's Democracy Index from 2016 (EIUDI2016) [18] was used as a democratic indicator. Furthermore, to account for equality and gender, the Global Gender Gap Index 2016 (GGPI2016) [19] was used. These three datasets were then merged using multi-criteria decision analysis (MCDA), which is a method that allows the evaluation and ranking of different alternatives based on a selected number of criteria that can be individually weighted [20, 21]. A fourth dataset, the Corruption Perceptions Index 2016 (CPI2016) [22], was used to benchmark the index created through the MCDA. The reason for using the CPI2016 was that the level of corruption control in a nation correlates with its degree of civil society participation [23] (Table 1).

2.1 Description of Data

In the EIUDI2016 index, countries are distributed by regime type, as seen in Table 2.

Table 1. Description of data

Dataset	Description	Source
UN e-Government Survey 2016 (UNES2016)	The United Nations has benchmarked the e-Government and e-Participation of 193 nations in 2003–2005, 2008, 2010, 2012, 2014 and 2016. The e-Participation Index evaluates the use of online services to provide government information to citizens, interaction with stakeholders and engagement in decision-making processes	United Nations (2016) [10]
The Economist Intelligence Unit Democracy Index 2016 (EIUDI2016)	Since 2004, the Economist has published regular democracy indexes. The 2016 overall index is based on five indicators: electoral process and pluralism, functioning of government, political participation, political culture, and civil liberties. The countries are then divided into four groups: full democracies, flawed democracies, hybrid regimes, and authoritarian regimes (see Table 2)	The Economist Intelligence Unit (2017) [18]
Global Gender Gap Index 2016 (GGPI2016)	The Global Gender Gap Index is a product of The World Economic Forum. The first measure was released in 2006. The index is based on four indicators: economic participation and opportunity, educational attainment, health and survival, and political empowerment. GGPI2016 is a relative measure of the condition of women compared to that of men in a nation and is not an indicator of the overall situation	The World Economic Forum (2016) [19]
Corruption Perceptions Index 2016 (CPI2016)	The Corruption Perceptions Index by Transparency International is a measure of corruption within the public sector of nations. The index is based on surveys and expert opinions	Transparency International (2017) [22]

Table 2. Distribution of regimes (EIUDI2016)

Regime type	N
1: Full democracy	19
2: Flawed democracy	56
3: Hybrid	38
4: Authoritarian	50
Total	163

2.2 Procedure

MCDA is a method for ranking alternatives based on several criteria with assigned weights [20, 21]. The weighted sum model (WSM) is the most straight-forward MCDA model and requires that all the criteria use the same scale. Since the scores could be expressed between 0 and 1, the WSM was utilized. According to the WSM, a decision problem is assumed to consist of m alternatives and N criteria. The relative weight for a criterion C_j is expressed by w_j. a_{ij} is the value of alternative A_i when it is evaluated in terms of a criterion. Then, the total value of $A_{i^{Score}}$ is defined as:

$$A_{i^{Score}} = \sum_{j=1}^{N} w_j a_{ij}, \; for \;\; i = 1, 2, 3, \ldots, m$$

The research was carried out through the following steps:

1. Definition of alternatives:
   As described in Sect. 2.1, the alternatives that are to be ranked are countries listed in the UNES2016 and EIUDI2016 and GGPI2016 and CPI2016.
2. Selection and definition of criteria:
   e-Participation, democracy, and gender equality were chosen as criteria to create a new index (see Fig. 1).

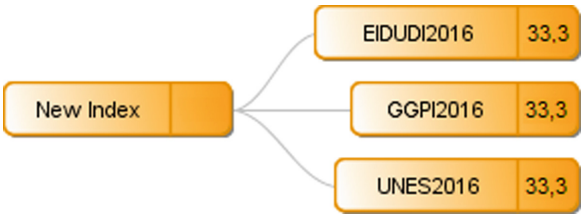

Fig. 1. New index with criteria

3. Assessment of scores for each attribute:
   Scores were extracted from the UNES2016, EIUDI2016 and GGPI2016 datasets. The datasets were formatted in IBM SPSS 23 and Microsoft Excel.

4. Standardization of the scores to make the criteria comparable with each other:
   Each score was expressed on a scale between 0 and 1. Theoretical maximum and minimum were used as a global scale: 1 was treated as the optimal scenario for each criterion, while 0 was considered the worst-case scenario.
5. Weighting of criteria, to assign priorities to them:
   At this point in the research, equal weights were used for all criteria (0.333). A weighting sensitivity analysis for the UNES2016 criteria was performed in step 7.
6. Ranking of the alternatives:
   The UNES2016, EIUDI2016 and GGPI2016 were inserted in a multi-criteria decision matrix created in Excel. The weights for each set were set as equal (0.333) to calculate final scores.

Table 3. Sample MCDA matrix

Country	UNES2016 (W = 0.333)	EIUDI2016 (W = 0.333)	GGPI2016 (W = 0.333)	Total score (new index)
Finland	91,525	9.03	0.845	0.88686

For example, the total score for Finland in Table 3 is calculated by expressing the criteria between 0–1, followed by multiplying the score for each criterion by its weight, and then summing all the products. In this case, equal weights were applied to the criteria, which gives the following results:
(0.91525 * 0.333) + (0.903 * 0.333) + (0.845 * 0.333) = 0.88686

7. Test the ranking.
   The total score in the new index was then entered into SPSS. To test how the new index fared against the UNES2016, CPI2016 was used as a benchmark using linear regression. The hypothesis was that the total scores from the new index should correlate more strongly with the CPI2016 than would the UNES2016 would. In addition, a weight sensitivity analysis was performed using the Decerns MCDA DE software [24]. Finally, Person's correlation was utilized to show the correlations between all indexes.

3 Results

Table 4 presents the e-Participation (ePart) rankings of the top 11 countries in the UNES2016 and Table 5 presents the results based on the new index created from the data in UNES2016, EIUDI2016 and GGPI2016. The new index consists of 139 countries. As shown, the most notable difference is that the top 11 countries in the new index are full democracies, while the flawed democracies have been degraded. All the Nordic countries have gained positions in the new index.

To test how well the new index fared compared to the UNES2016 in terms of democracy, both indexes were tested against the CPI2016 by using linear regression. Figure 2 contains the results from the UNES2016/ CPI2016 dataset and Fig. 3 from the

Table 4. Top 11 ranking and scores, UNES2016

UNES2016 rank (new index rank)	Score	EIUD2016	GGPI2016	CPI2016	Regime type
1 United Kingdom (5)	1.0000	8.36	.752	81	1
2 Australia (3)	.98305	9.01	.721	79	1
2 Japan (13)	.98305	7.99	.660	72	2
4 South Korea (18)	.96610	7.92	.649	53	2
5 New Zealand (2)	.94915	9.26	.781	90	1
5 Netherlands (6)	.94915	8.80	.756	83	1
7 Spain (9)	.93220	8.30	.738	58	1
8 Singapore (27)	.91525	6.38	.712	84	2
8 Canada (7)	.91525	9.15	.731	82	1
8 Italy (15)	.91525	7.98	.719	47	2
8 Finland (1)	.91525	9.03	.845	89	1

Table 5. Top 11 ranking and scores, new index

New index rank (UNES2016 rank)	Score	EIUDI2016	GGPI2016	CPI2016	Regime type
1 Finland (8)	.88686	9.03	.845	89	1
2 New Zealand (5)	.88450	9.26	.781	90	1
3 Australia (2)	.86748	9.01	.721	79	1
4 Norway (27)	.86504	9.93	.842	85	1
5 United Kingdom (1)	.86180	8.36	.752	81	1
6 Netherlands (5)	.86085	8.80	.756	83	1
7 Canada (8)	.85290	9.15	.731	82	1
8 Sweden (28)	.83806	9.39	.815	88	1
9 Spain (7)	.83257	8.30	.738	58	1
10 Denmark (22)	.82836	9.20	.754	90	1
11 Iceland (50)	.82751	9.50	.874	78	1

new index/ CPI2016 dataset. As shown, the new index has fewer outliers and has a higher correlation (see Table 6) with CPI2016 than the UNES2016 has. Furthermore, in the UNES2016 e-Participation Index, 8 authoritarian regimes can be found among the top 50 countries, with one in a top position as number 22. The full democracy with the lowest position in the UNES2016 e-Participation Index is positioned as number 74. In the new index, these rankings are changed, with the authoritarian regime moving from a ranking of 22 down to 75, and the full democracy moving up from 74 to 28. In Figs. 2 and 3, the authoritarian regime ("A") and the full democracy ("D") are compared. As shown, they are closer to the regression line when using the new index. Figure 4 reveals that the UNES2016 criteria needs a weight of 59.5%, given that the weights of EIUDI2016 and GGPI2016 remain similar, for regime A to achieve a greater ranking than D. That scenario seems unlikely when considering the trade-offs such a weight would imply.

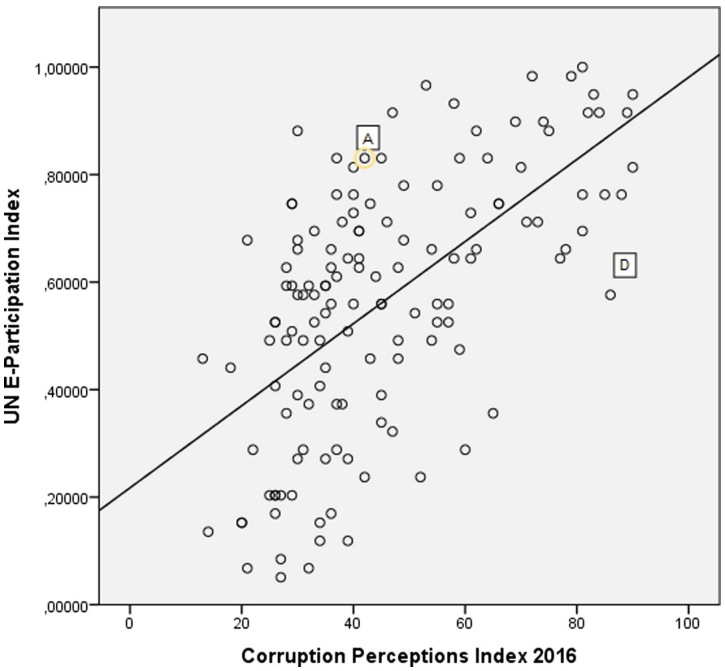

Fig. 2. UNES2016 and CPI2016

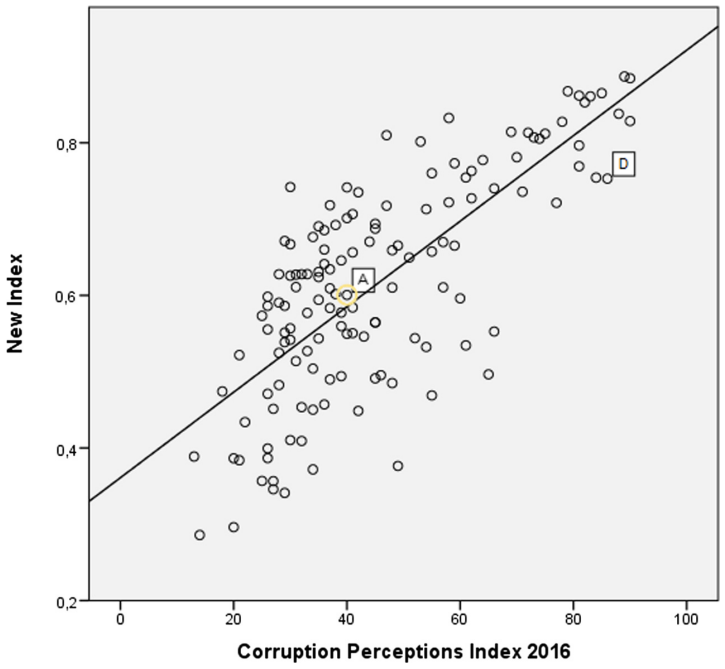

Fig. 3. New index and CPI2016

Finally, Table 6 shows the correlation between the different indexes. As can be seen, the New index has the strongest correlation with the CPI2016 compared to all included indexes.

Table 6. Correlations between indexes

	New index	UNES2016	EIUDI2016	GGP2016	CPI2016
New index	1	.872**	.869**	.625**	.765**
UNES2016	.872**	1	.624**	.362**	.619**
EIUDI2016	.869**	.624**	1	.580**	.760**
GGP2016	.625**	.362**	.580**	1	.516**
CPI2016	.765**	.619**	.760**	.516**	1

**Correlation is significant at the 0.01 level (2-tailed).

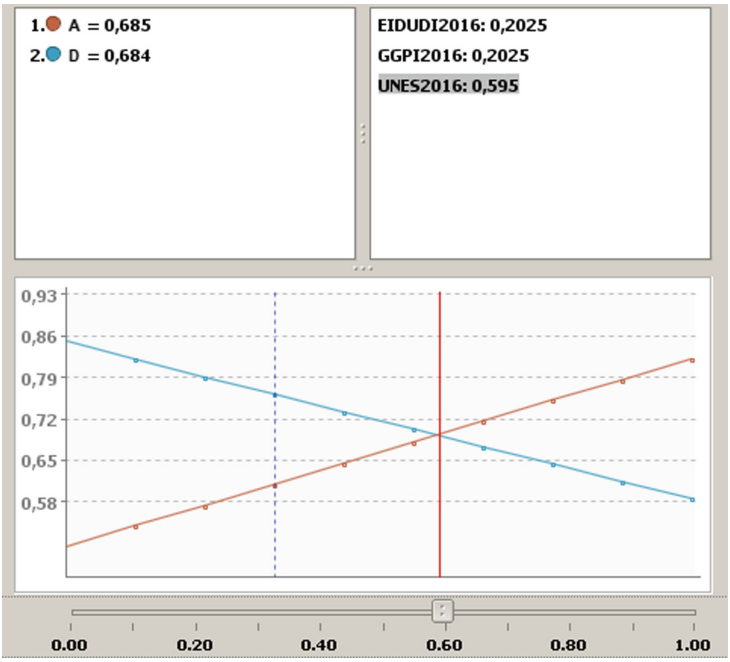

Fig. 4. Weight sensitivity analysis of the UNES2016 criteria

4 Concluding Remarks

The purpose of this paper was to develop a method for evaluating e-Participation that takes into account a nation's democratic system. Multi-criteria analysis was utilized to create a new index by combining datasets ranking levels of democracy and equality with the UN e-Participation index 2016. In the resulting index, a country needs to have

a solid democratic base with equality between men and women to rank highly. Building on this foundation, e-Participation can become a deciding criterion, inspiring nations to develop innovative participatory processes. However, no nation will gain a prominent position by focusing on technology and web services alone. By utilizing MCDA, several indexes can be combined and assigned individual weights. The study was not without limitations. In the current research stage, no method for weighting criteria has been utilized. Furthermore, although the suggested method incorporated democratic and gender equality criteria, it does not evaluate whether users actually influence processes and policies through e-Participation, should an index measuring actual user impact be created, it could be incorporated into the model. The results of this study contribute to the improvement of e-Participation evaluation practice by introducing normative criteria for good governance.

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Evaluating E-Participation Institutional Design. A Pilot Study of Regional Platforms in Russia

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Abstract. The paper presents an attempt to develop an e-participation evaluation technique that considers institutional design, compatible with large- and small-N analysis, as well as useful for policy-makers. Based on the new institutionalism and previous research, we assess the development of *access*, *embeddedness* and *control* features of e-participation. The framework is tested on 85 Russian regional e-participation portals, followed by the analysis of factors that might explain the variation. Possible applications and future research are also discussed.

Keywords: E-Participation · Evaluation · Institutional design
Russian regions

1 Introduction

Why does e-participation look as it does, and what factors move the innovation forward? One answer is proposed by the *explaining* perspective, that is "regarded as providing an account of a phenomenon on the basis of an outsider's perspective" [28]. In fact, quantitative analysis of e-government/e-participation has provided us with a rich account on political, socio-economic and technological factors that drive innovations [19, 23, 34, 36], but the key problem here is the one of measurement. The *UN E-Participation Index* and similar techniques have been criticized for measuring mostly technological aspects and ignoring the context [7, 11, 12, 24]. The *understanding* perspective, on the contrary, views e-tools development as a process of institutional building and adaptation, with actors' choices and actions in a certain context [28]. It goes deeper into detail but lacks a large-N comparative perspective. Reconciliation of both approaches is hard but necessary to evaluate e-participation comprehensively.

We suggest that the first step here is the shift of assessment techniques from technological readiness to the internal configuration of e-participation tools themselves. Various features of e-participation can be viewed as regulators of citizens and officials' behavior that basically form its *institutional design*. The latter, on the one hand, is a result of actors' choices within a certain context, on the other hand, is resulted in

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outcomes related to democracy and decision-making. This view corresponds to the new institutionalism [13], which is becoming more popular in the area [14, 15].

In this paper we propose a measurement that, we suppose, fit the idea outlined above. Our goal is to exemplify the possibility of quantitative evaluation of e-participation institutional design features. We present a pilot study of the Russian regional e-participation portals' institutional design, carried out in 2017. We propose a theoretical framework of such assessment, operationalize the dimensions and conduct a quantitative evaluation of 85 regional portals of Russia. Finally, we discuss the possible factors explaining the variation, outlining problems and future directions of research.

2 E-Participation Institutional Design Evaluation

2.1 Related Work and Analytical Framework

E-Government/E-Participation studies have offered a variety of evaluation methodologies so far. Some of them go deeper than *the UN Index* to look at the qualitative aspects of e-participation arenas tools [37, 38]. The established practice is checking the availability of the preset website features, but the questionnaires differ greatly upon theoretical and practical underpinnings [39]. Nowadays more research emphasizes the impact of design on e-participation success, since the way a website is organized may foster or hinder participation [35]. The registration and authentication rules do matter [5, 25], as well as the user-friendliness of design and the responsiveness of the officials [20].

E-participation must also give necessary incentives to decision-makers and be incorporated well into the "the daily routines of political processes along the various stages in the policy life-cycle" [32: 145]. Hence an e-tool should not be considered apart from the level of its institutionalization into the decision-making system [4]. The development of participatory design and its evaluation is becoming an imperative of e-participation evaluation [20], going beyond *perceived usefulness* and *ease of use* to consider "procedural and institutional context" [21: 22]. As technology develops, current issues are to be considered, e.g. mobile and social media dimensions [26].

We understand the *institutional design* here broadly as a set of rules that shape the behavior of involved actors [10]. Each feature employed on a website, as well as legal and other norms that connect it to the decision-making, are to be viewed as (1) results of equilibrium that reflects the preference of actors and (2) sources of information for actors on the outcomes of their actions, clarifying their incentives and costs to act [13]. But to assess causes and effects of these institutional configurations, one should first explore the variety of choices available, and link them to the expected outcomes.

There have been several methodologies proposed so far that link institutional design of e-participation to democratic values and effective decision-making. To mention a few, Östling found the features of e-petition portals institutional design (e.g. moderation) that heavily impact their democratic quality in terms of *equality*, *accountability*, *freedom* and *responsiveness* [30]. Bryson et al. distinguish several design features that should be met, i.e. *legal requirements, inclusiveness, social justice, public information* etc. and map them to required procedures and measurable outcomes [2].

Another approach, developed by Smith, suggests that democratic innovations should reflect the values of *inclusiveness, popular control, considered judgment and transparency* that allow citizens to participate and scrutinize authorities [33].

Based on these findings, we suggest that the institutional design of e-participation should meet the following crucial requirements: (1) *access*, i.e. the incentives for citizens to be actively involved in e-participation processes; (2) *embeddedness*, i.e. the ways e-participation activities are entrenched into the bureaucratic process and political system, incentivizing decision-makers; (3) *control*, i.e. institutions that provide transparency and public control over bureaucratic performance.

In case of *access*, e-participation should, first, lower the barriers for citizens to engage, as it was initially meant to be working [27]. However, there is a plethora of evidence that digital and participatory divides remain persistent hurdles [1, 31]. We suppose that the problem of *access* should not be considered a mere exogenous factor, like the Internet-penetration, skills and human capital, but it needs to be dealt internally by designing inclusive e-participation [29]. Potential participants are to be provided with on-site support, FAQ and search facilities to start. Secondly, e-participation should also expand its reach using new technological affordances, like the social media or smartphones [22]. Thirdly, e-participation tools should not motivate tokenism on the first place, but to stimulate constant engagement and communication.

But this is not enough. Many e-participation initiatives have been criticized as incapable of brining citizens into decision-making, remaining consultative, if not symbolic structures [6]. While civic activism online is growing and does impact policies in many respects, this mostly cannot be considered a success of the formal channels. An effective e-participation institutional design needs to be embedded into the decision-making via regulations bridging networked online activism structures and hierarchical bureaucratic system, converting citizens' aspirations into the signals taken for actions. Therefore, we expect e-participation to be more effective if there are clear legal regulations, defined workflow algorithms and other features facilitating the work of public officials.

Finally, citizens must have an opportunity to evaluate the way their demands are converted into policy outputs once they disappear in the "black box" [20]. The ability to control the government externally and see if it is responsive or transparent may rise what is called *efficacy* – perceived ability to influence government and be heard [8]. The more successful citizens' interactions with the government are, the more likely they continue to be involved. At the same time, transparency and control mechanisms can refrain decision-makers from neglecting citizens. This transparency and control can be achieved through reports and evaluations open for public scrutiny.

In general, we suppose the institutional design of e-participation that has the abovementioned features may provide a correct equilibrium to make the tool working, contributing to human development, democracy and bureaucratic efficiency. It gives positive incentives for citizens to constantly engage with the government, raising their efficacy and waiving costs of participation. At the same time officials also get necessary incentives: *embeddedness* helps to build new tools in the ordinary workflow, while control mechanisms impose costs on non-compliance.

2.2 Operationalization of *Access*, *Embeddedness* and *Control*

The abovementioned dimensions need to be operationalized in the way they can be assessed quantitatively, as the availability of different website features and legal norms. To evaluate e-participation portals, we have checked the availability of the following elements:

- *Access*:
  - System of registration;
  - Pre-moderation of appeals;
  - Personal user's account;
  - System of rankings or statutes for users of the system;
  - Q&A system;
  - Feedback and support from developers;
  - FAQ facility;
  - Search engine;
  - Mobile application or/and mobile version;
  - Accounts in the social media.
- *Embeddedness*:
  - The regional legislation defining the procedures of citizens' appeals processing;
  - The defined algorithm of how appeals are handled;
  - The classifier that helps citizens to identify the type of their address when submitting and links it to a certain mode of governmental actions.
- *Control*:
  - The opportunity for citizens to evaluate their experience of interaction with the government on the website;
  - The opportunity for users to evaluate other citizens' appeals;
  - Official reports on the results of governmental handling of citizens' appeals;
  - Openness of citizens' appeals to other users;
  - The "public control" function, i.e. the system allows citizens double-checking and reporting if the government has really handled the request properly;
  - Maps or GIS systems that may be used for detecting the problem geographically.

3 A Pilot Study of Regional E-Participation in Russia

3.1 E-Participation in Russian Regions: An Overview of Institutionalization Process

The first attempts to build up e-participation in Russia started in 2002 with the Federal Program "Electronic Russia". In 2006, Federal Law 59 was adopted to regulate the terms and procedures of processing citizens' appeals, but it did not provide an opportunity to do it electronically either. The situation changed in 2010 with a new wave of administrative reform, emphasizing the necessity to introduce the electronic workflow. Then Federal Law 59 was amended to introduce e-appeals. That proposition opened space for regional governmental and non-governmental e-participation platforms.

The next step in e-participation institutionalization in Russia started in 2012, with President Putin's proposition to develop the Internet democracy and the imperative of

taking citizens' opinion in decision-making seriously, especially on the municipal and regional levels.[1] It became a signal for subnational political elites to implement various feedback mechanisms, public consultations, and special information services. One of the leaders here was Moscow, which introduced an elaborate e-participation platform in 2012, and many regions followed this pattern.

A current stage of e-participation institutional development is connected to another federal initiative, according to which all regions now must have their own e-participation channels. In 2017 a Presidential Decree was adopted that makes all public bodies report to the Presidential Administration on their work with citizens' appeals.[2] The scheme of e-participation workflow in Russia is presented on Fig. 1.

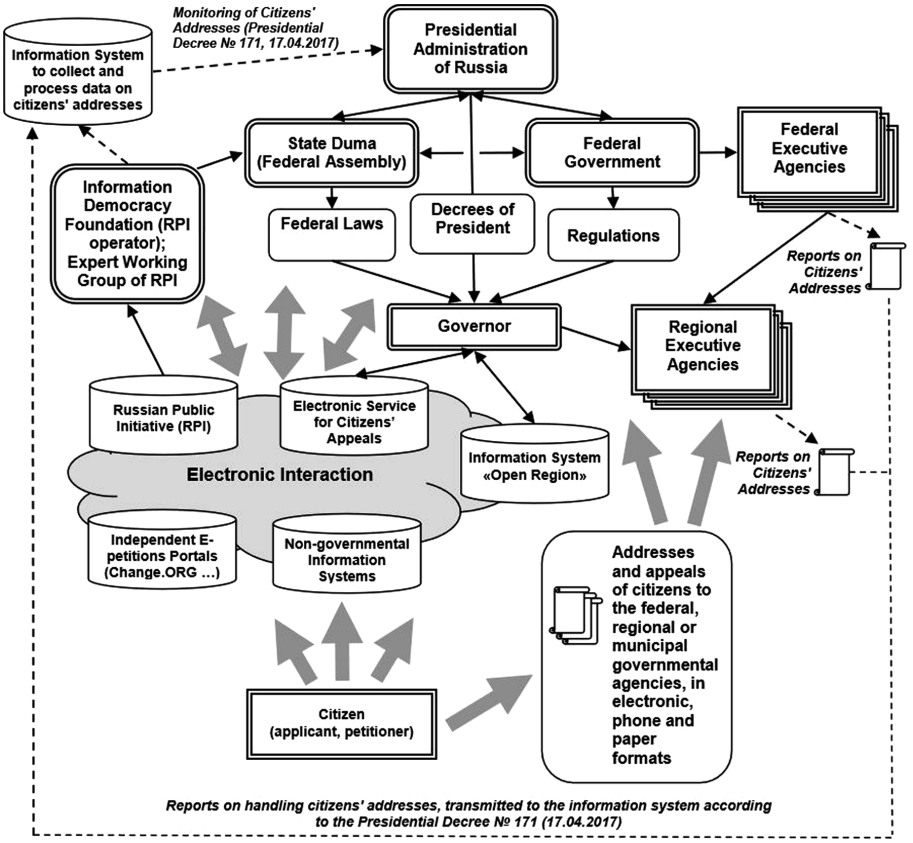

Fig. 1. Institutional scheme of regional E-Participation. Source: Authors' compilation of legal documents.

[1] Putin V.V. Democracy and Quality of Government. Kommersant. 06.02.2012. URL: http://kommersant.ru/doc/1866753 [in Russian].

[2] Decree of President No 171 "On Monitoring and Analysis of Citizens and Organizations' Appeals Results" (17.04.2017).

According to the compiled scheme, a citizen can address their claims to both non-governmental and governmental platforms, though it should be noted that only the latter are formalized by the law and hence perceived obligatory for authorities. Submitted complaints are then go to the respective regional authorities that are supervised by the federal agencies, as well as the governor. Once the appeal is processed, the governmental body must report on it to the applicants, as well as submit it to the federal information system that collect all data on regional and federal agencies' compliance and responsiveness. At the same time, while governors are formally key decision-makers in the regions, the influence of the federal regulation is overwhelming. Hence, the system of e-participation in Russia is quite government-centered, i.e. the control mechanisms are based not on the public scrutiny, but on the top-down subordination principles. Considering the so-called power vertical in Russia, a hierarchical system of governance with the Presidential Administration as a vertex [9], those federal requirements have become a serious impetus for regional authorities to introduce and develop e-participation.

It seems, though, that the main goal of those initiatives is not to empower citizens, but to strengthen capabilities of the federal government to control regional ones, and to respond quicker to the potential hotbeds of social tension. The control imperative is clearly seen in successful regional e-participation portals as well [18]. Considering the Russian political system, it appears the only way to make e-participation work for citizens as well, when the vertical control can be a source of responsiveness [3].

3.2 Preliminary Results of Evaluation

Despite the overall federal strategy, there might be a substantial variation within 85 regions in the institutional design and its correspondence to the features outlined above. To explore this variety and to assess the validity of this framework to study e-participation, we have conducted a pilot evaluation of the regional e-participation portals in Russia: regional websites that deal with collecting and handling citizens' appeals and complaints to the governmental bodies. Surely, such assessment can be quite rough, but at least it may give an overview for further analysis.

For a pilot survey we have monitored 85 e-participation websites of all regions of Russia, as well as the available regional legislation, according to the operationalization specified in Sect. 2.2. The analysis was carried out in September-November 2017. During the process of monitoring several difficulties were encountered. First, it was not always easy to define the absence or availability of certain features, since all websites have different structures and navigation systems. Some e-participation tools are situated on the main regional governmental portals while the other have their own domains. To assess some of the internal features, like the classifier or user's account, we sometimes had to register into the system. Some websites were in the process of reconstruction, and although a tool might have been available, it didn't work properly.

If a certain feature from the list was available, a region got a score of "1", and "0" in case of absence. All scores were then computed to make an average score for (1) *access*, (2) *embeddedness* and (3) *control*, as well as a total index.

The aggregate results for the index and its components can be found in Table 1, while an interactive map with data for all 85 regions is available online,[3] as well as the dataset[4]. Overall, the regions are quite different in e-participation institutionalization. The total index mean is 0.5 – which means that on average nearly half of the features we looked for are missing on the website. The most frequent total score is 0.4, which corresponds to about 8 features out of 19. The *embeddedness* component seems, at least on paper, to be the most successful: many regions have adopted specific legislation to formalize the workflow on the portals. However, we could not find any special legal footing for 26 regional e-participation tools, and the classifier of citizens' appeals is the rarest thing with only 25 subjects having them. Again, we cannot judge whether bureaucracies exactly follow the law if they have one, but at least this is a crucial step towards decreasing bureaucracy discretion.

The *access* component is also performing quite satisfactorily, and few regions do not have any features that stimulate citizens' engagement. However, the configuration varies deeply. While many regions introduce moderation and registration system, only a few have users' accounts and rankings that would stimulate more active involvement. Hence, participation instruments still usually act as "complaint boxes". Also, only 39 regions have mobile apps or versions, while 45 subjects have official accounts in the social media (at least that have links to them on the portals).

The worst situation, as was anticipated, is with the *control* component. The average score here is only 0.3 out of 1, while the mode is even lower. Mostly, complaints and addresses go to the "black box" of government, and only complainants receive the results of their handling. The rest of the citizens are usually unable to see both the appeals themselves and the aggregate reports of how the government acts. Double-checking of governmental activities via public control remains a rare practice. Citizens' inability to view transparently governmental activities in relation to e-participation put the effectiveness of such mechanisms under serious doubts.

There are certain groups of regions that can be characterized as leaders and outsiders in e-participation institutionalization. Their classification has been done using a cluster analysis (k-means) to form four groups of regions, which are shown in Table 2 with some examples. The first cluster comprise of the least developed regions in terms of their e-participation institutionalization efforts. The most distinctive feature of them is the lack of *embeddedness* of e-participation, since they usually do not have any special regulation or clearly visible algorithm of the workflow. The *access* and *control* dimensions are also weak. On the contrary, the fourth cluster represents the leaders in e-participation development, like Moscow, St. Petersburg and Tatarstan, which have always been taking the highest positions on e-government and e-participation development [4, 18]. The second and third clusters are the most inhabited clusters somewhere in the middle. They are quite close in performance, but the third cluster is lagging because these regions mostly lack proper legal footing. It should be noted that the values are distributed quite normally, which makes them compatible with the widespread quantitative methods, like regression analysis.

[3] http://qoo.by/47Tx.

[4] goo.gl/o2kNxW.

In general, this pilot survey has revealed the opportunity to operationalize and measure our model, grasping the variety of e-participation institutional designs. This opens a way to a further deeper analysis of choices public officials make and outcomes assorted designs produce.

Table 1. Descriptive statistics of the E-Participation institutionalization index (Russian regions). Source: Authors' calculations

	Cases	Mean	Mode	Standard deviation
Total index	85	0.46	0.4	0.19
Access	85	0.52	0.7	0.22
Embeddedness	85	0.58	0.7	0.34
Control	85	0.3	0.2	0.24

3.3 Exploring the Variety of Designs

We claim that our measurement is not a mere artifact of technological development, but an estimation of how e-participation is connected to the democratic and effective decision-making process. The deep analysis of causes and effects of the institutions we have explored is the next step we need to take during testing the validity of measurements. However, to preliminary assess the findings we run a correlation analysis of the indices we got with the variables that are commonly used to explain e-government and e-participation performance in Russia and worldwide [19, 23, 34, 36], namely the level of technological and human development, as well as the effectiveness of bureaucracy. We use the most current available data from the Russian Statistical Service (Rosstat). The regional technological development is operationalized by the Internet penetration rate (2016), the human development is assessed by the level of higher education (2010), the average income (2016) and the share of urban population (2016). The effectiveness of bureaucracy is the most difficult to approach, but we use the share of civil servants in the regional population (2015), which proves a good proxy for effectiveness in some studies [19]. The results, based on the Pearson's correlation analysis, are shown in Table 3. The closer the score to 1, the stronger is the association between the variables, significance is measured at the 0.01 level (**) and 0.05 level (*).

Though correlation does not mean causality, it shows that the level of institutional development is significantly and positively associated with the technological and human development of a region, as well as with its bureaucratic performance. It basically suggests that we are close to quantifying the phenomenon we claim to measure. Technologically advanced, urbanized and less bureaucratized regions are more likely to innovate towards more accessible and transparent e-participation: in this regards, e-participation, citizens' empowerment and good governance may reinforce each other. Innovation might be a function of citizens' pressures, civil society, human capital and bureaucratic performance. At the same time, not all components seem to be associated with this dynamic, especially the *embeddedness*, making us think of agency rather structural factors. For instance, as has been shown previously, the successful

Table 2. The classification of regions based on K-means cluster analysis. Source: Authors' Calculations

Cluster center score	Cluster			
	1	2	3	4
Access	0.31	0.51	0.56	0.82
Embeddedness	0.05	0.74	0.21	1
Control	0.14	0.25	0.31	0.76
Number of cases	17	47	10	11
Examples	Ivanovo, Kaluga, Ryazan, Sverdlovsk obl.	Tyumen, Yaroslavl, Belgorod obl.	Kalmykia, Dagestan, Komi, Smolensk obl.	Moscow, St. Petersburg, Tatarstan obl.

institutionalization of e-participation in St. Petersburg was possible to a larger extent due to the policy entrepreneurship of government officials and strong political will of the governor himself [18]. The control imperative of the power vertical should also be considered as a factor, and we may hypothesize that the more region is dependent on the federal support, or the weaker it is vis-à-vis the national government, the more efforts are made to embed e-participation as a formal procedure. This calls for a research perspective that combines quantitative assessment with in-depth case study.

Table 3. The results of the correlation analysis. Source: Authors' calculations

	Total index	Access	Embeddedness	Control
Internet penetration	.378**	.427**	.190	.253*
Higher education	.409**	.402**	.234*	.337**
Urban population	.312**	.311**	.202	.229*
Average income	.207**	.235*	.062	.116
Bureaucracy effectiveness[a]	−.293**	−.256**	−.149	−.290**

Note: **- Pearson correlation is significant at the 0.01 level (2-tailed), *- Pearson correlation is significant at the 0.05 level (2-tailed); [a]– the inverse relationship should be read the way that the less bureaucratized a region is the most effective.

3.4 Discussion: Limitations and Future Research

Our findings contribute to the studies that emphasize the importance of institutional context for e-participation performance and call for careful designing e-participation platforms to ensure intended outcomes. We provide a framework and a tool that can measure quantitatively the variance of intuitional features employed, at the same time discerning aspects for deeper qualitative study. However, the estimation is quite rough so far and needs further improvement.

The first major limitation of the proposed framework is that it neglects the role of informal institutions, that is, unwritten but observed rules of behavior, which are no less important, as the new institutionalism suggests. Informal norms are usually deeply embedded and may conflict with formal institutional innovations to totally subvert their positive effects to maintain status quo [17]. For instance, corruption and informal links that structure bureaucratic behavior may persist regardless of how successful e-participation arrangements seem on paper and on websites.

The second limitation is quite a legalist understanding of *embeddedness* as a formal inclusion of e-participation into the normatively defined workflow, which might indeed be quite far from the reality, influenced by political power relationships. The third limitation is the so-called design-reality gap that is observed in e-projects, especially in the developing countries. Although e-participation might be designed the way it properly incentivizes citizens and bureaucracy, it does not guarantee its successful implementation due to managerial, financial and human factors [16]. We may theorize and speculate on how the institutional design foster e-participation, but we cannot be sure about its outcomes until we empirically test its effects.

The future research may be thus related to minimization of the abovementioned drawbacks. First, we need to elaborate our technique by purifying the operationalization of *access*, *embeddedness* and *control*. New measurements of inclusiveness may be included, like the availability of features that enable participation for people with disabilities, provide incentives to discussion, deliberation and community building. A more thorough view on the legislation and algorithms would also contribute to the estimation. Also, we plan to measure not only the availability of different institutional features, but also the quality of them as well. The index can be normalized by the inclusion of corruption, democracy, and civil rights assessments to assess the importance of informal institutions. Alternatively, surveying public officials and citizens on their experience with e-participation tools may be worthwhile. Another fruitful way to assess *control* might be to run the experiment that would measure the true pace and quality of government officials' responses to citizens.[5] Secondly, we may expect this index to become an empirical data in the analysis of factors that drive institutional innovation. In Sect. 3.4 we have stated a promising possibility for such quantitative research, and specification of explanatory models would be useful.

4 Conclusion

The proposed framework, as well as the results of the pilot study, needs to be updated theoretically and empirically to overcome the limitations mentioned in the previous section. However, some conclusions can be drawn.

First, the framework and evaluation technique presented can be used both for large-N explaining perspective, as data is compatible with statistical analysis, and case-based or small-N understanding perspective that is a valuable to explore internal factors of e-participation *access*, *embeddedness* and *control* dimensions development. The value of

[5] We thank an anonymous reviewer for this insightful suggestion.

the framework, we argue, is in its new institutionalism core, since the paradigm is popular with various scientific fields (politics, sociology, economics etc.), which contributes to the multidisciplinary mixed-method approach. Furthermore, we have tried to move away from the stage-model to more positivist view of e-participation here and now. Operationalization has taken into account the recent development of e-participation, like the social media and mobile technologies, as well as a broader look on legal documents that back e-participation, going beyond websites.

Secondly, our pilot study of Russia, currently being institutionalized e-participation instruments, has shown that despite an overall federal strategy and hierarchical imperatives of the "power vertical", regions perform a substantial variety of outcomes. The key problem seems to be the lack of the control from citizens and governmental transparency, which puts a question, quite rhetorical, if citizens or federal authorities – are the key beneficiaries of innovations. However, the institutional innovations continue which opens space for more active civic engagement in policy-making. The preliminary correlation analysis has revealed some structural factors that might explain the variation (like socio-economic conditions, technological readiness and bureaucratic efficiency), but the role of agency should be explored as well.

Finally, the proposed framework and measurement, we suppose, can be refined and adapted to study other cases, especially in case of subnational (regional or municipal) e-participation development. They can be used not only for scientific purposes but employed by policy-makers as a benchmarking tool to see where they lag behind. In general, we hope that the paper will open further discussion on the role institutions play in contemporary e-participation development.

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Evaluation of Government Information Systems Effectiveness: The Case of e-Participation Portals in Russia

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Abstract. This paper is devoted to the study of methods for assessing the effectiveness of public information systems that can identify the relationship between the characteristics of individual factors of their creation and assess the impact of these factors on their overall effectiveness and ability to create public values. After reviewing, selecting and adapting an evaluation methodology, it was tested with several e-participation portals. This choice was due to both the growing interest in increasing the effectiveness of these portals, and the relative availability of initial information for analysis. During the research, a number of hypotheses were formulated and tested. The results obtained and presented in this paper confirm the suitability of the chosen methodology to solve the stated tasks of effectiveness assessment of government information systems and the influencing factors.

Keywords: Government information systems · Effectiveness · Public values
e-Participation

1 Introduction

Information and Communication Technologies (ICT) penetrated steadily into all spheres of life in past decades. In social communication, the given process has occurred quite spontaneously [1]. However, in the field of communication between a government, citizens and business the management component of this ensemble plays a huge role [2].

In scientific literature at first much attention has been paid to e-services delivery [3, 4] and the development of "good governance" [5] with ICT. Gradually, scientists came to the conclusion about the impact of digital transformation influence on public values formation of various types [6–8]. Electronic interaction includes not only the interface interaction with users of public services portals but also rather complex connections of the participating information systems. Moreover, researchers already proposed a list of public values components counting: efficiency, effectiveness, intrinsic enhancements, transparency, participation, collaboration [8]. Viale Pereira [9] revealed value generating the mechanisms pointing out a significant potential of open data initiatives in creating values.

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Undoubtfully, the created values themselves are significant indicators of the quality of information systems [10], but their effectiveness, often understood as the ability to realize demanded public values by optimally using resources and balancing the associated risks [11] is also crucial. Particularly, precise measurement and management of the information systems effectiveness becomes important in the face of limited resources and the need to early obtain the necessary benefits.

At the same time, considering examples of countries with a highly centralised management system (like Russia), it is necessary to consider the existing peculiarities of government information systems management.

This paper describes an attempt to assess the effectiveness of e-participation portals in Russia from the perspectives of such stakeholders' as Federal Government, Regional Authorities and Citizens.

The paper has the following structure: Literature review provides a review of appropriate government information systems effectiveness assessment approaches and indicators. Methodology section demonstrates the author's framework for information system evaluation. Section "Findings" illustrates the results of Russian projects in the field of e-participation based on the methodology proposed. Section "Conclusion and discussion" concentrates on the key research results and the future steps.

2 Literature Review

We started our research from the analysis of government information systems effectiveness assessment approaches in the studied area.

In one of the early works devoted to the goal we studied it was said that Effectiveness is determined by comparing performance to a goal and the way to assess system effectiveness is first to determine the task objectives of the system, or of the organizational units utilizing the system, and then to develop criterion measures to assess how well the objectives are being achieved [12]. This point of view remains relevant up to our time. The following main problems mentioned in Scott's work remain important so far: (1) Objectives and measures of accomplishments are often not defined adequately at the outset of an IS implementation effort [13]; (2) Efficiency-oriented and easily quantified objectives and measures are typically employed while effectiveness-oriented and qualitative objectives and measures are ignored [14]; (3) Objectives and measures used to evaluate the system are not the same as those defined initially [15]. In more recent works, discussion of these problems is rare, although our experience shows that they still exist and have a significant impact on the achievement of the necessary effectiveness of the information systems being created and on the ability to evaluate effectiveness by comparing goals and outcomes.

Bozeman and Moore are the founders of methods for assessing the effectiveness of public services (and the information systems providing them) using the concept of the public value created by them. It was they who proposed to measure "context-specific preferences of individuals concerning, on the one hand, the rights, obligations, and benefits to which citizens are entitled, on the other hand, obligations expected of

citizens and their designated representatives" [16, 17]. Research into the further development and application of this approach has shown its usefulness for improving the quality of government decisions in the field of application of information technologies, including the area of improving communication between the government and citizens [18–20]. Indeed, a number of studies has proven that the focus on measurement and achievement of public values leads to an increase in the effectiveness of government agencies and their information systems: Effectiveness of public organisations itself creates public values [16]. Citizens expect efficiency, openness, and responsiveness from public organisations [21, 22]. E-government can be used for improving the efficiency of public organisations by cutting processing costs, and making strategic connections between and among government agencies [23] through developing better ICT infrastructures, re-designing public functions [24], sharing public information and empowering public staff [25]. Since public organisations run on taxpayers' money, citizens value the improved efficiency of public organisations through e-government [26].

The studies surveyed revealed that more than 100 indicators of public value and effectiveness were proposed and used, among them: ensuring environmental sustainability, transforming citizens' interests into political decisions, openness, internal efficiency, etc. Unlike the traditional model of public administration, the concept of social value emphasises that the list of social values is formulated not by those who provide public services, but by the citizens who can express their preferences through various instruments of interaction [27]. It also argues that public perceptions of values such as trust and democracy should play a leading role and be complemented by other values such as cost-efficiency and effectiveness [28].

Judging by the large number of publications on research on the effectiveness of state information systems, one of the most popular is the PVIT (Public Value of Information Technology) technique [29]. Perhaps, one of the most extensive and carefully implemented studies on the effectiveness of e-government using this method was conducted in 2012 by Professor K. Karunasena in Sri Lanka [30]. Many subsequent studies, for example, in 2016 in South Africa [31], in 2017 in Turkey [32] and in Taiwan [33] were based on the modification of Karunasena's methodology.

An early analysis of the declared objectives of IT projects and their relationship to content and target indicators is critical, since the expected benefits of implementing state-owned IT projects can be realized only if they are clearly identified already in the design process and are reflected in the key documentation of the project being launched [34]. In response to this need for government authorities, the Department of Public Administration of the University of Albany (USA) in 2012 developed and proposed for free use a methodology and tool for the evaluation of the PVAT (Public Value Assessment Tool) project portfolio [8], which is further logical development of the PVIT methodology. The PVAT methodology was applied to the formation of IT project portfolios in several US government organizations and showed good results that are of practical importance for increasing the effectiveness of their outcomes [35].

Returning to the definition of the effectiveness of information systems given in the CobiT 5 standard [11] and temporarily refusing the impact of risks, we can calculate the overall effectiveness of an information system using indicators characterising the goals set, the goals achieved, and the costs incurred. However, considering the need to take these indicators into account in the set of organisational subsystems and in a variety of dimensions, such simple calculations become complicated. A practical model for solving the task of calculating the complex efficiency was justified and proposed in the form of the Global Organizational Effectiveness Index Subsystem (GOEIS) meta-model [36].

3 Research Methodology

This research aims to investigate the effectiveness of government information systems, understood as their ability to realise demanded public values by using resources optimally. To adequately accomplish this aim, a theoretical framework is required for providing the foundation for the implementation of both the quantitative and qualitative studies.

The theoretical framework is developed based on such theoretical concepts as the theory of public value, the sources of public value creation, inventories of public value and information systems effectiveness measurement described in Literature review section. In summary, the effectiveness of public value creation greatly depends on public bodies and their information systems organisations, various stakeholders, and their interactions [20, 22].

Based on these theoretical perspectives and the indicators derived from various e-government performance evaluation methodologies discussed in Literature review, a theoretical framework for evaluating the effectiveness of government information systems in Russia is hypothesised and shown in Fig. 1.

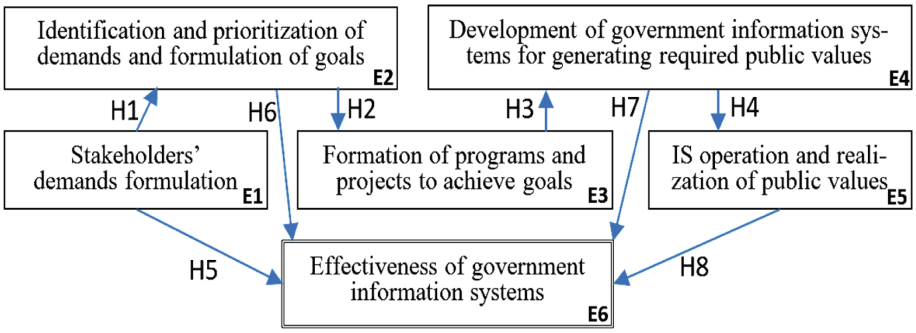

Fig. 1. The theoretical framework for evaluating the effectiveness of government information systems

The relationships stemming from the stakeholder's conscious demands to the effectiveness of government information systems, that are created to meet these demands, became the basis for the formulation of a series of reflective research hypotheses as shown in Fig. 1 and summarised in Table 1.

Table 1. An overview of the hypotheses

Hypothesis	Description
H1	All stakeholders are known, and effective tools for identifying their demands are available
H2	The interests of all stakeholders are properly prioritised and consolidated into a consistent system of goals and programs/projects for their achieving
H3	The government IS development programs/projects are aimed at achieving the set goals and is provided with the necessary resources
H4	The created government information systems generate the required public values
H5	The identified stakeholders' needs are used in assessing the effectiveness of created government information systems in the form of target indicators
H6	The costs of continuous stakeholders' needs identification and prioritising efforts are considered
H7	The costs of government information systems creation and maintenance are considered
H8	The target and realized public values are measured by the same indicators

This research is going to be both confirmatory and exploratory. The confirmatory nature of the research is reflected by its objective to test a hypothesised theoretical framework for evaluating the public value of government information systems in Russia. The exploratory nature of the research is characterised in its pursuit of investigating the sources of effectiveness, how government information systems create public value for stakeholders in Russia, and how the existing practices in implementing IT initiatives can be improved for delivering better public value to its stakeholders [37].

A mixture of qualitative and quantitative approaches was chosen to implement the research, since it allows the researcher to test a theory by understanding the various factors in the theory and establishing relationships between the factors, and also to explore the reasons behind the relationships [38].

To test and validate the theoretical framework, the data were collected from open sources (regional state information systems development plans, Public Procurement Portal, descriptions of the public IS introduction results submitted to the all-Russia competition Prof-IT, state statistics portal, etc.), some of which provide data in digitalised forms, but some in the form of analytical and descriptive texts that are to be preprocessed for further analysis.

To calculate the effectiveness of the studied government information systems, taking into account their number of dimensions and sub-systems, the GOEIS meta-model has been chosen. This meta-model is not limited and gives the opportunity to add or remove elements or vectors, depending on the system characteristics to be evaluated. Table 2 shows the meta-model and its components.

Table 2. GOEIS meta-model (Páscoa 2012).

Elements	Vectors	Planning vectors	Effecting vectors	Ratio effecting vs planning vectors	Effectiveness system value
A	Vector 1	xPA value	xEA value	xEA/xPA	Eff. value – V1A
	Vector 2	yPA value	yEA value	yEA/yPA	Eff. value – V2A
	Vector 3	zPA value	zEA value	zEA/zPA	Eff. value – V3A
B	Vector 1	xPB value	xEB value	xEB/xPB	Eff. value – V1B
	Vector 2	yPB value	yEB value	yEB/yPB	Eff. value – V2B
	Vector 3	zPB value	zEB value	zEB/zPB	Eff. value – V3B
…	…	…	…	…	…
		Total values of planning vectors	Total values of effecting vectors	Total values of the ratio E/P	Global effectiveness system value

To narrow the scope of research, government information systems supporting e-participation in Russia were selected as the object for pilot research. Taking into account the specifics of a rigid vertical state management system in Russia, three major stakeholder groups were selected for the study: the parent authorities that dictate the development goals of state information systems development are mandatory for execution at local level; local authorities responsible for identifying and satisfying the citizen's needs; citizens - users of state information e-participation systems.

Following the recommendations of GOEIS methodology selected, for initial analysis and verifying its applicability, the generalised specific needs of the three stakeholder groups (Parent Authorities, Local Authorities and Citizens) were used as vectors, and five primary functions of e-participation government information systems (Stakeholders' demands formulation; Identification and prioritisation of demands and formulation of goals; Formation of programs and projects to achieve goals; e-participation IS operation and realisation of public values) were taken as analysable elements. This narrowing of the research scope is due to the limited availability of open information needed for analysis, sources of which are: analysed e-participation portals, portals of authorities responsible for their functioning, detailed information on the processes of these portals creating, presented at the annual All-Russian contest of the best government IT-projects. Several independent e-participation portals were included in the study for comparison. For vectors, it was assumed that their effecting values are measured for each of the elements by the degree of their conformity to the corresponding hypothesis, and their planned values are assumed to be 100% consistent with the hypothesis. The numerical values of the effecting vectors (where 0% is the absolute

discrepancy and 100% - full compliance between the appraised portal and the hypothesis formulation) were obtained by averaging the expert assessments of 8 experienced analysts - employees of the e-Governance Center of the ITMO University, the Committee for Informatization of St. Petersburg and the Information and Analytical Center of the Administration of St. Petersburg. Additional evaluation of the validity of expert assessments are not performed at this stage.

Hypotheses H6-H8 were not included in the model at this stage and their analysis was done separately.

4 Results

The results of expert decisions on the numerical values of vectors for the analysed elements are given in Table 3.

Table 3. Initial data obtained as a result of e-participation sites expert evaluation

e-participation portal	Hypothesis - effecting vector's values (%)														
	H1	H1	H1	H2	H2	H2	H3	H3	H3	H4	H4	H4	H5	H5	H5
	V1	V2	V3	V1	V2	V3	V1	V2	V3	V1	V2	V3	V1	V2	V3
State-owned portals															
www.roi.ru	90	80	45	95	85	50	50	30	25	30	30	25	20	25	20
priemnaya.parliament.gov.ru	85	65	30	80	55	45	40	20	20	20	20	20	20	25	20
openregion.gov-murman.ru	75	55	50	70	65	55	45	35	20	35	35	20	25	25	20
idea.kemoblast.ru	80	65	45	70	65	55	30	30	15	30	30	15	25	20	15
open.krasnodar.ru	70	55	40	80	60	50	45	40	20	25	40	20	20	25	20
open.tatarstan.ru	90	70	60	80	75	50	35	30	25	30	30	25	30	30	20
golos.openrepublic.ru	70	35	55	65	50	55	50	40	30	25	40	30	25	30	20
narodportal.ru	60	40	35	60	50	40	55	45	30	25	45	30	30	35	25
ag.mos.ru	85	65	50	77	70	55	35	30	30	30	30	30	30	30	20
gorod.gov.spb.ru	80	70	60	80	50	40	40	45	40	25	45	40	25	30	25
open-penza.ru	85	60	50	70	50	50	50	35	45	30	35	45	25	30	25
vmestekirov.ru	75	65	45	65	60	55	40	30	35	20	30	35	20	25	20
Average effecting vector's value	**79**	**60**	**47**	**74**	**61**	**50**	**43**	**34**	**28**	**27**	**34**	**28**	**25**	**28**	**21**
Independent portals	5	40	60	10	30	80	20	30	60	50	30	60	15	35	65
narexpert.ru	10	55	85	20	40	85	15	30	55	60	30	55	30	35	60
www.angrycitizen.ru	25	45	80	40	35	75	25	35	50	55	35	50	25	40	60
onlinePetition.ru	40	50	75	50	40	80	30	25	60	60	25	60	25	30	70
change.org	35	55	80	40	50	80	25	30	55	55	30	55	30	35	65
beautiful_petersburg.rf	23	49	76	32	39	80	23	30	56	56	30	56	25	35	64
Average effecting vector's value	**5**	**40**	**60**	**10**	**30**	**80**	**20**	**30**	**60**	**50**	**30**	**60**	**15**	**35**	**65**

For each of the analysed portals, calculations were made of the effectiveness, both global and in sections of hypotheses and individual vectors using the GOEIS technique. The results of calculations for all portals are summarised in Table 4.

Table 4. Consolidated settlement results for all analysed e-participation portals

e-participation Portal	Portals' effectiveness by hypothesis and vectors (%)								
	H1	H2	H3	H4	H5	Global effectiveness	Average		
							V1	V2	V3
State-owned portals									
www.roi.ru	32	40	4	2	1	16	57	50	33
priemnaya.parliament.gov.ru	17	20	2	1	1	8	49	37	27
openregion.gov-murman.ru	21	25	3	2	1	11	50	43	33
idea.kemoblast.ru	23	25	1	1	1	10	47	42	29
open.krasnodar.ru	15	24	4	2	1	9	48	44	30
open.tatarstan.ru	38	30	3	2	2	15	53	47	36
golos.openrepublic.ru	13	18	6	3	2	8	47	39	38
narodportal.ru	8	12	7	3	3	7	45	43	32
ag.mos.ru	28	30	3	3	2	13	51	45	37
gorod.gov.spb.ru	34	16	7	5	2	13	50	48	41
open-penza.ru	26	18	8	5	2	11	52	42	43
Average values:	**23**	**23**	**4**	**3**	**2**	**11**	**50**	**44**	**35**
Independent portals									
narexpert.ru	1	2	4	9	3	4	20	33	65
www.angrycitizen.ru	5	7	2	10		6	27	38	68
onlinePetition.ru	9	11	4	10	6	8	34	38	63
change.org	15	16	5	9	5	10	41	34	69
beautiful_petersburg.rf	15	16	4	9	7	10	37	40	67
Average values:	**9**	**10**	**4**	**9**	**6**	**8**	**32**	**37**	**66**

Based on the results of the surveyed e-participation portals effectiveness calculations, supporting organisational structures descriptions and related information systems, it became possible to draw preliminary conclusions on the hypotheses formulated at the beginning of the research. Since the obtained results indicate an unsatisfactory situation, the conclusions given in this paper are concentrated on the problems found. These conclusions are summarised in Table 5.

Table 5. Main conclusions on hypotheses

Hypotheses	Conclusions
H1 All stakeholders are known, and effective tools for identifying their demands are available	The demands of key stakeholders have been identified with varying degrees of completeness often using improper tools and approaches
H2 The interests of all stakeholders are properly prioritised and consolidated into a consistent system of goals and programs/projects for their achieving	The key stakeholders' needs are systematised and presented in the form of the official objectives design of the planned projects does not allow to achieve these goals entirely. The indicators used rarely reflect the achievement of the set goals
H3 The government IS development programs/projects are aimed at achieving the set goals and is provided with the necessary resources	The implementation of programs/projects is aimed at attaining target indicators, not goals, since Target indicators do not reflect the achievement of official goals (see Conclusions of H2)
H4 The created government information systems generate the required public values (social, political, economic)	Created e-participation portals generate the required public values to some extent. However, the composition of these values does not coincide in composition and size with the required
H5 The identified stakeholders' needs are used in assessing the effectiveness of created government information systems in the form of target indicators	The practice of assessing the created e-participation portals effectiveness is observed in the initial state only and the use of identified stakeholders' needs for this purpose is rare
H6 The costs of continuous stakeholders' needs identification and prioritising efforts are considered	In the studied open information sources, no information was found on the cost characteristics of efforts to identify and prioritise the stakeholders' needs
H7 The costs of government information systems creation and maintenance are considered	For all surveyed e-participation portals, this hypothesis was entirely valid
H8 The target and realized public values are measured by the same indicators	This hypothesis is true. However, the adopted target indicators are not able to assess the degree of achievement of the objectives, as was said earlier

Some differences between government and independent e-participation portals are of interest. Government portals are more successful in identifying the needs of stakeholders and in formulating the goals of development programs than independent portals which are more successful in these goals implementation. This finding is illustrated by the data presented in Fig. 2.

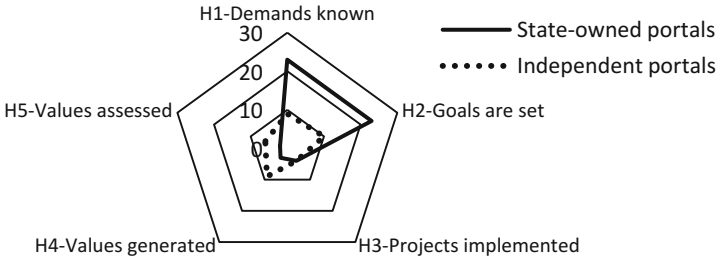

Fig. 2. The degree of the hypotheses fairness for state and independent portals

However, it is possible to observe significant differences between state and independent portals in their striving to satisfy various stakeholder groups. This is evident from Fig. 3.

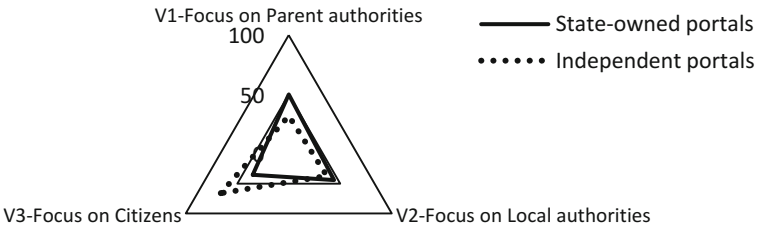

Fig. 3. Different focus of efforts to meet the needs of stakeholders

In general, the results of this study showed the suitability of the method chosen to assess the overall effectiveness of public information systems and to assess the contribution of some organisational factors to overall effectiveness, which may be useful for more effective management of these systems.

5 Discussion

The study contributes to understanding on management factors in IT projects development and implementation. The framework proposed could be of interest for GCIOs and IT-managers facing some issues of IT effectiveness and its measurement indicators. The model proposed involves the assessment of external environment, upper-level management system, goal setting, planning and organisation of government information systems operation, operational management, outcome parameters, and collection of data on the status and results, as well as integrated effectiveness.

The author's approach to combine a management cycle and public values types (social, political, economic) was first applied on e-participation cases since these portals provide new ways to solve citizens' needs and demands not just in an operational way (as e-services) but in some part of qualitative decision-making.

The limitations of the study are connected with the limited number of assessed projects as well as the orientation on very specific Russian projects context. The study counted data from the contest, at the same time some interviews with portals developers could shed light on internal management operations.

The following studies will be focused on further improving the described model of effectiveness evaluation. Among our immediate tasks we can mention the following: searching for and testing source data more objective than those used in this study, application this model to other IT project types, the comparison of calculated effectiveness levels of different managerial systems.

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MPs and Audiences on Social Media During Emergencies: Automatic and Manual Content Analyses of Facebook Posts

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Abstract. The social media channels of the members of parliament (MPs) are significant arenas through which communication between the public and national leaders occurs. This is the first paper to explore how these channels function during emergencies. We present findings from a mixed-method study of automatic and manual content analysis of a unique dataset of all posts in Israeli MPs' Facebook pages during the 19th Israeli parliament. We compare the scope of posting, engagement with posts, and the content in MPs' Facebook pages during "ordinary" periods and an "emergency" period, focusing on the 2014 Israel/Gaza war. Findings present MPs' social media pages as key hubs of information and interaction between MPs and audiences in emergencies, even more so than during ordinary periods. MPs' social media pages involve significantly more posts, and engagement with posts, during emergencies, and the content in them becomes more emotional, less personal and focused on the emergency situation and the national leaders responding to it.

Keywords: Emergencies · Facebook · MPs Facebook pages · New media Social media

1 Literature Review

1.1 Media in Emergencies

The media are the source of many *uses and gratifications*. The two main gratifications emerging as most significant in a considerable portion of the studies are *cognitive* and *social.* Additional gratifications found in the relevant and popular studies range from recognition, status, and professional advancement to expression, individual and generalized reciprocation, leisure, escapism, fun, entertainment, arousal, and more [1, 2].

The media also plays a significant role in the *framing* of public issues. Frames can be described as central organizing ideas or story lines [3], which hold the potential to shape individual understanding and opinion pertaining to an issue by emphasizing specific elements or features relating to the broader picture in a manner which promotes a particular problem, definition, causal interpretation, moral evaluation and/or treatment recommendation [4].

The significance of media usage and framing may be of particular importance during emergencies and crises; when needs are intensified and become more acute on

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one hand, and on the other hand, the scope of information generation and circulation becomes more rapid compared to ordinary times [5, 6]. Hence, people may find it increasingly difficult to make sense of the situation in its entirety and generate a clear picture of the state of affairs. Uncertainty and risks may cause anxiety, stress, anger and even depression stemming from a diminished sense of security and stability resulting from people's lack of information or control. Indubitably, studies demonstrate that the perceived importance of the media, and the enhanced scope of needs, which media are expected to fulfill significantly, increase during times of emergency [5].

1.2 Online Social Media in Emergencies

The contemporary media ecology is highly dynamic. New media channels, including major news websites, online social media and mobile applications, have become established means for generating and consuming content alongside the traditional mass media.

These vicissitudes are evident in Israel, in which data for the current study were collected. Israel has been the world leader with regards to the percentage of the population who uses Facebook and with regard to the average amount of time users spend on Facebook [7]. Furthermore, Israel was ranked 15th in the World Economic Forum's Networked Readiness Index of 2013 [8]. Between 65%–85% of mobile phone owners have smartphones; 54% of Israelis access the Internet through their smartphones [9].

These transformations are evident during emergencies as well. Studies on the use of new media in emergencies point to the centrality of such channels [6, 10]. In a study of media usage during the Israel/Gaza war (2014), it was found that mass media channels remain dominant with respect to "top-down" information dissemination, nevertheless when it comes to "bottom-up" requests and provision of assistance, self-expression and keeping in touch, social and mobile tools, especially WhatsApp, are dominant [5].

Facebook played a unique role in communications during the war. On the one hand, Facebook was used to promote collaborative initiatives, such as campaigns to participate in funerals of soldiers who had no immediate family in the country (lone-soldiers), visit wounded soldiers in hospitals, and/or organize and send packages to soldiers at the front, among others. On the other hand, Facebook became a prominent platform of violent discourse, for case in point, boycotts (for example of artists who protested against the war), and many "unfriendings" between people who disagreed with each other [11].

1.3 Patriotism and Rallying Around the Flag During Emergencies

An additional phenomenon that typically occurs in the mainstream media during emergencies is its patriotic enthusiasm, and focus on national symbols and national leaders [12]. Indeed, academic literatures that study communication patterns in wars and significant security crises (such as the first and second Palestinian uprisings) in the Israeli context [13–16] demonstrate a consistent pattern in which the mainstream media changes from a critical tone to a tone which emphasizes the in-groups at the extent of the out-groups and visually places more focus on national symbols and leaders, compared to ordinary times. The enhanced and more positive exposure of the public to

its leaders in emergency times is typically followed by an increase of public trust in its leaders (i.e. the "rallying around the flag" effect [17]).

Note that the enhanced and positive coverage of the leaders tends to dissolve following a period of time. If the war lasts for an extended period of time, then typically voices that are critical of the causes of fighting, strategies and length of fight, emerge. Whilst this phenomenon occurred prior to the rise of new media, some argue [18] that this increases due to the sheer quantity of contemporary media channels, their availability to the public, and the rising ability of publics to participate in conversations about the fighting (for case in point, through online forums and user comments, and contemporarily social media platforms such as Facebook and WhatsApp).

1.4 Contact Between Politicians and Audiences Through Social Media

As social media takes a more prominent place in the media environment in general and during emergencies in particular, it is conceivable that contact between MPs and the public during emergencies may shift more and more on social media as well.

Many regard the Internet in general and social media specifically as useful tools for assisting parliamentarians to maintain a continuing dialogue with their constituents and the general public [19, 20]. Whereas in the past, MPs relied on the mainstream media for coverage and exposure, contemporarily they can use their social media pages to interact with audiences directly, cutting out traditional intermediaries (such as parties) and the mass media [21]. Indeed over the past few years, it has become evident that presence in key social media arena's such as Facebook, becomes mandatory for politicians. In this current study, we found that 106 out of 120 MPs from the Israeli parliament maintain a Facebook page, sometimes with extensive activity.

MPs' social media channels have thus become central information and conversation media tools for various agents, including MPs themselves, journalists, as well as the general public. While studies demonstrate that this assertion may hold during ordinary times, it can arguably hold in emergencies as well. Nevertheless, the literature about new and social media usage in emergencies focus almost exclusively on how bureaucracies make use of these channels in order to advance and implement their policies, and how citizens use these in order to realize their needs. There are almost no studies characterizing the public discourse in central social media arenas in emergencies in general (for one exception see [22]), and in MPs' social media channels vis-à-vis the public in particular.

A small number of studies have looked at the content of posts by politicians which become more popular compared to others [23]. It appears that generally, emotion acts as a predictor of social media contents potential popularity. Studies examining the virality of Twitter tweets suggest that emotion, whether positive or negative, affects tweets' virality with the most retweeted ones being tweets expressing some sentiment or another [24, 25]. More specifically, news content was found to be more viral when it was negative, and social content was most viral when drafted positively [26].

Since MPs' social media channels are significant arenas through which communication between the public and national leaders takes place in ordinary times and arguably during emergencies as well, this study makes a unique contribution to understanding the scope and framing of public activity during times of emergency.

1.5 The Israel/Gaza War, 2014

The Israel-Gaza War of 2014 has been the longest military operation ever waged by the State of Israel. The immediate background to the operation was the kidnapping (on June 11th) and murder of three Israeli teenagers by members of the Palestinian organization Hamas. The victims' bodies were found nearly three weeks later. This period was characterized by an increasing frequency of rockets fired from Gaza at civilian populations in southern Israel in June 2014.

The military response quickly escalated into a full-scale military operation that commenced on July 7th, 2014 and lasted 50 days. During this period, rocket firing was frequently carried out towards civilian population in the communities surrounding the Gaza strip, the Southern parts of Israel and beyond. A total of 3,600 rockets and mortars landed in Israel, 224 of which landed in urban areas [27]. During the operation, 67 Israeli soldiers and 5 civilians were killed and some 1,620 soldiers and 837 civilians were injured. On the Palestinian side, 2,203 Palestinians were killed, and over 11,000 Palestinians were injured.

2 Research Questions

The study investigates the interaction between citizens and MPs on Facebook, by analyzing posts content and engagement. The following research questions focus on a comparison between ordinary times and times of emergency, with the aim to illustrate how direct communications between MPs and citizens are influenced by crisis and whether they conform to previous observations on media in times of emergency.

2.1 Publication and Engagement During Emergency and Ordinary Times

RQ1. Are there differences in the scopes of publication and user engagement with posts in MPs' pages during emergency and ordinary times?

H1. We expect to find an increase in *post publication rate* and *user engagement* with politicians' posts during times of emergency, as users may be inclined to use MPs' social media platforms more intensely and focus more attention on political messages compared to ordinary times, aiming at satisfying their increasing needs [4, 5].

2.2 Content of Posts Published During Emergency and Ordinary Times

RQ2. Are there differences between posts published by politicians during emergency and *ordinary periods* in terms of *discussing emergency issues*?

H2. We expect that posts published during times of emergency would be significantly more oriented towards discussions regarding the national emergency, on-topic, and related to the current state of affairs.

RQ3. Are there differences in the proportion of *personal posts* published by politicians during times of emergency and ordinary periods?

H3. As emergency periods are characterized by a greater sense of patriotism and emphasis of national symbols, we expect to see less personal stories in politicians' posts during times of emergency.

2.3 Sentiment and Tone of Posts Published During Emergency and Ordinary Times

RQ4. Are there differences in sentiment of posts published by politicians during emergency and ordinary periods?

H4. We expect posts to be *more negative and less positive* during times of emergency when compared to ordinary periods.

RQ5. Are there differences in the level of criticism and support expressed in posts published by politicians during national emergency periods compared to ordinary periods?

H5. We expect to find posts published by politicians during times of emergency to express more *support*, foremost towards groups most affected by the emergency situation. However, as *extended* periods of emergency may be characterized by controversy among politicians regarding goals and operations conducted and not conducted by the state, we also expect to find an increase in *criticism* as well.

2.4 Textual Differences Between Posts Published During Emergency and Ordinary Times

RQ6. What are the prominent terms in the texts of politicians' posts, and are there terms that specifically dominate posts published during emergency periods?

3 Methodology

A list of all 120 members of the 19th Israeli parliament (beginning February 5th, 2013, until December 9th, 2014) was composed based on data from the parliament's website. To locate the official Facebook page of each MP, Every MPs' page in the parliament website was scanned for a link to the MPs formal Facebook page. This was followed by a search with Google's search engine and finally within Facebook, entering the name of each MP in Hebrew, Arabic, and English, Israel's three official languages. 106 MPs' formal Facebook pages were found and included in the study.

All 106 pages were scraped using Netvizz, a Facebook app developed by Digital Methods Initiative labs[1]. We used the application to extract and archive all of the posts

[1] We thank Digital Methods Initiative and the developer, Bernhard Rieder, for the use of this tool.

published by either the pages or users during the entire 21-month period of the 19th parliament. In total, our dataset included 441,974 posts. Netvizz automatically attaches the following information to every post: publication date, post origin (page or a user-anonymized), post text and various engagement measures, i.e. number of likes, comments, and shares that the post received. It should be noted that during the period examined, Facebook had not yet introduced reactions, therefore the above engagement indices are the only ones relevant for the posts extracted for this study. As the aim of the study is to examine the Facebook activity of all Israeli MPs throughout an entire service of the parliament, the period of the 19th parliament was chosen for the extraction of the data (the 20th parliament is still at service at the time of writing).

To analyze the posts, we used a combination of automatic and manual content analyses. The automatic analysis is based on information retrieved by Netvizz, while the manual coding was conducted on a sample of each MP's bi-monthly, most popular post. In order to generate the sample, we divided the entire period of analysis into periods of two months. Then, for each of the periods, and for each MP, we sampled the leading post/s in terms of number of likes. The decision to look at number of likes rather than number of comments or shares was made on account of "likes" being the preferred and most common type of user engagement with posts in the dataset, engaging more users than other types of engagement. The most-liked post sample, which consisted of 994 posts, included posts authored by MPs only, as the focus of this study surrounds content posted by MPs which is most favorable by users. The sampling method described above enabled the equal representation of each MP, throughout the entire period examined.

Manual coding was conducted by five coders who were trained by the researchers. Repeated training sessions were conducted for categories that achieved less than 90% reliability, until inter-coder reliability of 90% was achieved in all categories. The content and tone of posts were coded according to the following categories:

- Discussing emergency issues.
- Personal Story (e.g. "Joyful times: A new granddaughter was born to our family").
- Criticism or support of a person or entity. A post could be either critical (e.g. "The haughty government led by Netanyahu, Bennet and Lapid"), supportive (e.g. "PM Netanyahu's decision is a brave one"), or neutral- does not include criticism or support or includes both equally.
- Object of criticism/support (e.g. another politician by name, a formal entity in the parliament, citizens, publics, non-parliamentary public figures, public figures outside of Israel, Media organizations).
- Positive tone (e.g. "We have finally and successfully passed the legislation").
- Negative tone (e.g. "Terrorists belong behind bars and not at the parliament").

For the analysis of prominent terms we created two corpuses: The "*ordinary*" corpus included the texts of all posts published during the *ordinary* period, and the "emergency" corpus included the texts of all posts published during the emergency period (between June 11th and August 26th, 2014). For each corpus, we used n-gram

extraction tools to extract co-occurring words frequencies in the texts.[2] The tool implements an algorithm that extracts the number of co-occurrences of words in the text [28]. We configured the tool to extract terms containing between two and five words, which appear at least 50 times in the texts. For a comparison of shared and different n-grams between the two corpuses, we used the online tool Compare Lists[3] developed by the Digital Methods Initiative labs which compares two lists of keywords for common and different words in each list.

4 Findings

4.1 Publication and Engagement During Emergency and Ordinary Times

As Table 1 demonstrates, 16.3% of the posts in the dataset (71847 out of 441974 posts) were published during the emergency period. This proportion is slightly larger than the proportion of this period in the dataset (76 days out of 673 which are 11.3%), suggesting that this period has been slightly more active in terms of Facebook posting. But when looking at posts published by politicians only (excluding user-authored posts) it appears that politicians are not more active during times of emergency. In fact, the proportion of posts published by politicians matches exactly the proportion of the

Table 1. Posts and engagement with posts during emergency and ordinary periods

	Entire period	Ordinary (88.7%)	Emergency (11.3%)
Posts (users and MPs)	441974	370108 (83.7%)	71847 (16.3%)
Posts (MPs only)	38242	33892 (88.6%)	4350 (11.4%)
Likes (all posts)	M = 83.85, SD = 970.53	M = 72.26, SD = 774.22***	M = 143.53, SD = 1643.81***
Likes (MPs posts)	M = 928.4, SD = 3164.8	M = 748.53, SD = 2439.48***	M = 2329.83, SD = 6283.19***
Comments (all posts)	M = 8.81, SD = 95.7	M = 8.11, SD = 82.96***	M = 12.43, SD = 144.45***
Comments (MPs posts)	M = 89.18, SD = 312.79	M = 75.35, SD = 263.1***	M = 196.94, SD = 554.78***
Shares (all posts)	M = 6.73, SD = 193.76	M = 5.1, SD = 76.43***	M = 15.09, SD = 448.07***
Shares (MPs posts)	M = 75.94, SD = 652.3	M = 53.99, SD = 240.55***	M = 246.94, SD = 1804.86***

*** $p < .001$

[2] https://homepages.inf.ed.ac.uk/lzhang10/ngram.html. We thank the developer, Zhang Le, for the use of the tool.

[3] https://tools.digitalmethods.net/beta/analyse/.

period in the dataset: 11.4% (4350 out of 38242) of politicians posts were published during the period of the kidnapping and the military operation.

Due to these measures' highly skewed distribution, a series of Mann-Whitney tests were conducted to test for significant differences in engagement between the two time periods. The tests confirmed the differences between posts *published by MPs only* during emergency and ordinary times, with emergency posts receiving significantly *more likes* ($U = 53835203$, $p < .001$), *more comments* ($U = 58073772.5$, $p < .001$) and *more shares* (55801516.5, $p < .001$) than posts published by MPs during ordinary times. The differences are also significant for *all of the posts* published by users and by MPs (For likes: $U = 10973979370$, $p < .001$; For comments: $U = 10977161638.5$, $p < .001$; and for shares: 13038566507.5, $p < .001$). These findings support H1.

4.2 Differences in Content of Posts Published During Emergency and Ordinary Times

Turning to analysis of the 944 most-liked posts sample demonstrates significant and dramatic differences in content relating to emergency situations during the emergency period (50%) compared to ordinary times (3.4%), i.e. half of the preferred posts were related to the emergency situation. This supports H2. However, users also preferred posts which did not discuss the events half of the times, suggesting that politicians and users alike saw an importance in addressing other issues during that period.

Only 9.2% of politicians' posts published during the time of national emergency included a personal angle of story (unrelated to politics), compared to 18.7% during ordinary times ($\chi^2 = 7.62$, $p < .01$). This finding supports H3.

Table 2 summarizes the significant differences found between politicians' posts published during ordinary and emergency periods.

4.3 Differences in Sentiment and Tone of Posts Published During Emergency and *Ordinary Periods*

Posts in the most-liked sample published during the emergency period are less positive (47.9% vs. 62.5%) and more negative (65.5% compared to 44.2%) compared to posts published during *ordinary periods*. These findings support H4.

With respect to criticism and support, posts are more supportive during emergency (28.9%) than during *ordinary period*s (18.4%). In *ordinary periods*, support is targeted toward certain groups (25%) followed by citizens (20.7%) and non-parliamentary public figures (18.6%). In emergency, support is first and foremost directed at citizens (46.3%) followed by certain groups (24.4%, such as, for example, "the soldiers", or "residents of the south" living in areas suffering most from missile launches).

Criticism is also more prominent during emergency periods (38%) compared to during *ordinary periods* (30.1%), with criticism during *ordinary periods* directed mostly at other politicians by name (19.2%), followed by non-parliamentary public figures (17.9%), and during emergency, directed at other politicians (33.3%) followed by, quite surprisingly, citizens (16.7%). These findings support H5.

Table 2. Differences between content of ordinary and emergency posts

Category	% of Emergency Posts	% of Ordinary Posts	Differences
Emergency	50%	3.4%	χ^2=271.59, p<.001
Positive Sentiment	47.9%	62.5%	χ^2=10.62, p<.01
Negative Sentiment	65.5%	44.2%	χ^2=21.83, p<.001
Support	28.9%	18.4%	
Criticism	38%	30.1%	
Neutral (No Criticism, No Support)	33.1%	51.6%	χ^2=17.42, p<.001
Personal Story	9.2%	18.7%	χ^2=7.62, p<.01

4.4 Textual Differences Between Emergency Period Posts and Ordinary Posts

Moving to an analysis of the prominent terms in each of the corpuses: the "*ordinary"* corpus, composed of the texts of all posts published during *ordinary periods*, and the "emergency" corpus, composed of texts of all posts published during the emergency period. We used the n-gram tool described above to extract prominent terms and compared ordinary and emergency prominent terms using the compare lists tool.

Ordinary Discourse. The list of frequent terms in the posts published during ordinary periods is led by two main figures: The Minister of Finance Yair Lapid, a former popular news anchor, recently entered into politics and the center of public attention throughout the study period, and the Prime Minister, Benjamin Netanyahu. The discourse is also dominated by direct applications to ministers ("Mr. Secretary") and expressions of demands ("I want"; "It's about time").

Emergency Discourse. The list of terms in the emergency corpus is led by a variety of terms supporting the Palestinians (e.g. "free Palästina" is no. 1 in the list, and "syrien" - no. 2). These are presumably the work of pro-Palestinian hacktivists who engaged in online attacks on officials' Facebook pages. The first terms unrelated to these messages are "Prime Minister", "the state of Israel" and "the Israeli People". Alike, "cease fire" is also prominent.

Comparing Between the Corpuses. Some issues which are common in the discourse that evolves on politicians' pages in ordinary times, are set aside during emergencies. A clear example is the word "equality", an often used word in various terms in the discourse: "Equal rights", "Inequality", "Equal opportunities", "Gender equality", and the like. Altogether, the word "equal" appears in 73 phrases, all of them were extracted from the *ordinary* corpus. None of the prominent phrases of posts published during the emergency period included a reference to the notion of equality.

Another topic only raised in *ordinary periods* is minimum wage: All 34 phrases mentioning minimum wage ("(The) Minimum Wage", "Raising the Minimum Wage", "Minimum Salary", and similar) were extracted from the *ordinary* corpus, while none came up in the emergency corpus analysis. On the contrary, the emergency discourse revolves, first and foremost, around issues relevant to the crisis. The word "Hamas" is included in 98 phrases, 6 of which ("Hamas", "With Hamas" etc.) were extracted from both corpuses, while the rest were extracted from the emergency corpus only.

5 Discussion and Conclusions

MPs' social media arenas are significant channels through which communication between the public and national leaders occurs. Many studies analyzed the content, and engagement with it, occurring in such arenas during ordinary times. The current study is the first to analyze them in emergency times; focusing on the 2014 Israel/Gaza war.

Studying content and engagement pertaining to MPs social media arenas *during emergencies* is important as needs are intensified and become more acute on one hand, and on the other hand the scope of information generation and circulation becomes faster compared to ordinary times. Sites that function as information hub in "ordinary times", as MPs' social media channels do, can thus function in emergencies as hubs of information and discussion, and possibly even drivers of patriotism and in-group collectivism, as the mainstream media tend to function in emergencies.

With more than 20,000 monthly posts and hundreds of thousands of comments, MPs' social media pages are definably a central hub for information circulation and discussion. While MPs themselves do not post more often during emergencies, there were certainly an increased number of posts on their pages during emergencies (i.e. users make many more posts to MPs pages during time of emergency, nonetheless MPs themselves do not). There is also significantly more engagement with these posts: posts made during emergencies gain significantly more likes, comments and shares than "ordinary times" posts.

Analysis of the content posted on MP pages during ordinary times and emergencies demonstrates that topics that lead the social media in "ordinary times" such as the discourse on equal rights gender equality, minimum wage and more, are neglected during emergencies, focusing on the emergency situation itself and the national leaders attending to it. MPs publish significantly less personal posts during emergencies, which further demonstrates how the collectivist spirit during national emergencies triumphs over MPs intention to present their "personal angle" online. Discourse seems to become more emotional, expressing more support (especially towards citizens, groups directly affected from the war and soldiers) and criticism (especially of politicians), demonstrating a more negative and less positive sentiment.

These findings indeed portray MPs social media arenas in emergencies as hubs of information and discussion, and as a patriotic and in-group collectivist arena. Future studies can compare these findings with findings from online social media arenas of public figures and entities in future emergencies in Israel and elsewhere.

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Urban Media Trends for Enabling Citizen Participation in Urban Planning: Old Wine in New Barrels?

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Abstract. In recent years, a plethora of new possibilities for interactive urban planning emerged, fuelled by the rise of smart cities. This paper studies the potential of urban media for reshaping the role of citizens in urban planning. Both the historical role that citizens have played in the development of neighbourhoods and the process of urban planning are presented from a literature review. Furthermore, present visions on urban planning and citizen participation in smart cities are reviewed. Lessons learned from this literature study, are confronted with six main trends in urban media from expert interviews. As a result, we deliver an overview that helps urban planners in neighbourhoods in order to profit from advantages of urban media while avoiding their risks. We found that the development of urban media could have both positive and negative effects with regard to citizen participation in urban planning in neighbourhoods.

Keywords: Smart city · Urban media · Citizen participation
Area development

1 Introduction

Citizens have become smarter due to their access to the internet, social media and other digital media, in particular in cities. Both the rise of the smartphone and mobile internet access have reshaped city life. Ever more cities develop specific strategies for bearing the fruit of smart and digital consumer technologies in a wide variety of policy fields and in spatial development [1]. Well known cities, often mentioned in literature as smart cities, are cities such as Barcelona, Amsterdam, Songdo, London and Masdar [2, 3].

Parallel with the increase of the possibilities for cities and local governments to become smart cities the possibilities for its inhabitants to become a smart citizen keep increasing as well [4–7]. The online toolkit available to smart citizens, can radically reshape the way they engage in the development of their own living environments. Urban media interactions are a key part of such an online toolkit. Urban media is a term that describes a wide variety of 'new' media that influence the use of public space.

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Examples of such media are mobile smartphone apps, social media, virtual reality and augmented reality [2, 8].

In today's networked society, as introduced by Castells [9], citizens tend to gain a more central role in urban planning [8]. The combination of these developments raise the question what the impact of urban media is on urban planning practices. Therefore, the main question of this article is; What is the added value of urban media trends for citizen participation with regard to area development within existing neighbourhoods? The main aim of this research is to gain insight in the opportunities and risks of the use of urban media, within the process of area development in neighbourhoods. More specifically, on the role of citizen participation. The research method consists of both literature review and qualitative research with experts. First, in the beginning of 2017, we performed a literature review concerning the involvement of citizen in area development. Insights in area development in neighbourhoods were derived from experts in policy making and area development. Since Hajer warned that "the smart city discourse is notoriously weak on historical awareness" [10], we have chosen to start the literature research with insights gained in early twentieth century. Also, contemporary literature was included with topics such as smart cities and area development. The second part of the study was based on qualitative expert interviews. Eight experts were interviewed regarding trends and developments with respect to urban media. These interviews were conducted in a face-to-face setting and used a semi-structured list of questions. Experts were selected from fields of expertise including area development in smart cities, participatory smart city developments and ICT. Expert interviews led to the definition of six relevant trends in urban media. Those trends were then confronted with the characteristics of area development.

The remainder of this article is structured as follows. In Sect. 2 we introduce a theoretical background. In Sect. 3 we will introduce the trends in urban media. In Sect. 4 we show an analysis of the findings. The final section is discussion.

2 Theoretical Background

The key concepts of this research are urban media, citizen participation and area development. We are aware of the vast amount of literature that covers the opportunities and pitfalls of e-participation and smart cities. We did not strive to provide a comprehensive overview of that body of literature. We focus completely on the new opportunities of Urban Media for area development in neighbourhoods. The term urban media is relatively new and has a relatively small base in literature. In 2018, only 81 peer-reviewed articles can be retrieved from Scopus mentioning this term in the abstract, keywords or title.

2.1 Participation in Area Development

Throughout the history of mankind, the quality of life in cities has been a matter of concern for city planners. Also, citizens influenced their own living areas. In early models, city planning was a heavily rationalized process, developed in a top-down manner. Urban designers presented blueprints of housing areas that needed to create a

living area for the rapidly growing cities. The role of citizens in the development of these plans was marginalized [11]. Models that had quality of life and diversity for inhabitants in mind started in late 19th century when industrialization created very bad living circumstances in rapidly growing cities. Ebenezer Howard proposed his famous model of Garden Cities in 1898. A model that he created as a reaction on the poor living conditions in English cities, such as London. His solution was to create a network of satellite cities with a maximum of 32000 inhabitants, surrounded by large green areas [8]. One could say that he would almost abolish cities, in favor of good living conditions for inhabitants. Not much later Le Corbusier proposed an opposite approach to the problem of dense and polluted cities of that time. His plans for 'La ville radieuse' and 'La ville contemporaire' proposed the development of megacities with millions living in it but build up as large buildings surrounded by massive green areas, thereby creating a livable space for inhabitants. The problem both plans tried to solve was the same: to create better living conditions for the people in the cities [12]. The CIAM-congresses in Europe or the mass development of New York under supervision of city planner Robert Moses, generated urban development plans regarding livable neighbourhoods for citizens. All of them doing so without actual participation of citizens. Much of the large-scale expansions of cities, pre and post-world war two, where developed in that way [13].

In the second half of the twentieth century a shift took place in the views on area development. Most prominent under the influence of Jane Jacobs, after she wrote her famous book "The Life and Death of Great American Cities" in 1961 [14]. This created a more central role for citizens in the process of city planning. Her plea for more actual involvement of citizens within the process of city making gained much acclaim and follow up. In 1965, Davidoff presented his influencing model of Advocacy planning [15]. A planning model that plead for more equality in urban planning. The model emphasizes the importance including the interests of several target groups living in urban areas [15]. Jacobs and Davidoff stressed that a broad representation of the public and participating in creating livable living conditions are crucial factors.

Already in 1969, Sherry Arnstein was the first to introduce a participation ladder theory to describe various levels of influence citizen can have in a policy making process [16]. Her model was widely accepted and evolved into several adaptations of the model including e-participation ladders. However, there is not much consensus within those different ladders [17]. An important lesson was that citizens could take different roles in the participation process [18].

2.2 New Relations Between Citizen and Government

In the last decade, another shift in the planning discourse can be acknowledged towards citizen leadership in urban development, particularly in neighbourhoods. Terms such as co-creation or grassroots initiatives describe this process [19]. In a new planning philosophy called radical incrementalism, a shift takes place in de the roles of government and civil society [20]. Unlike models of the past, governments do not propose blueprints of policy, but set wider, larger scale goals. Every project, initiative or experiment that seems beneficial for achieving these goals, is approached in a cooperative manner. Experiments that succeed, could be learned from and if scalable,

implemented on a larger scale. The dynamics of contemporary society functions as a catalyst for new ideas, projects and initiatives. Through process of trial and error, society learns what could be implemented successfully and what not. The model is based in the principles of incremental planning [21]. The model of radical incrementalism teaches us that a shift in ownership for policymaking and area development is necessary. Therefore, three principles regarding new relations between government and civil society are [20]:

1. Acknowledge the paradigm of the energetic society, for both finding solutions as in approach to policy challenges;
2. Attach to the experiences of the citizen;
3. Consider the societal dynamics as a catalyst for solutions, not for problems.

In this new relations and field of influence it is important for local governments to be clear in the role they take in different projects with regard to area development.

2.3 The Smart Citizen

With the rise of smart cities and its possibilities, the position of citizens change [1]. Together with the previously described changing discourse in urban planning and area development, the role citizens can play in the development of their own neighbourhoods can be redefined. As Castells described, internet and connectivity transformed our society into a network society [9]. The network society gives increasing opportunities and freedom of choice in groups to which we can bind ourselves and to which we feel connected. A process described by Wellman as networked individualism [22]. The individual citizen functions as a switchboard between the different networks. This creates a very strong, horizontally oriented organizational structure that could be used for citizen to organize themselves, improve experiments, exchange ideas and learn [23].

This provides the citizen with instruments creating possibilities that makes bottom-up area development possible. A process Townsend describes as a do-it-yourself-city [24]. The do-it-yourself-city is strengthened by the strong organizational structure of networked individualism. Townsend defines the do-it-yourself-city as ‘a city that is not centrally operated, but a city that is created, operated and improved upon by all’. This shows that the impact of networked individualism, also affects the role citizens play in area development in their own neighbourhoods.

In the Datapolis [25] approach, city’s government is seen as a central body, that makes decisions based on the gathering of urban data. The Centro de Operacoes Rio in Rio de Janeiro is a remarkable example of this type of governing. The role of citizen is marginalized. The opposite of this approach is a city that is not controlled from the cockpit, but commences out of a whole of uncoordinated activities, like a swarm [25]. This way of governing fits perfectly in the described shift in roles for citizen participation, and the shift towards networked individualism. Many authors now take an integrated perspective on smart cities instead of merely pushing technology. Caragliu, Del Bo and Nijkamp [26] state that a city is smart when: “investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.” As Neirotti et al.

made clear, a smart city can only be really smart when the city is capable of addressing real-life challenges and when it is able to bear the fruit of the social capital of the people involved in that city [27]. The involvement of smart citizens is essential. Smart citizens play a crucial role in smart cities by their participation in smart governance of local areas where they live or work [28].

2.4 Smart Citizen Participation in Neighbourhood Area Development

After the review of literature regarding the role of citizens in urban development in neighbourhoods, and analyzing the outcomes, we defined seven crucial aspects regarding the role of citizens in area development. These are:

1. Sufficient possibilities for citizens to participate [14, 20]
2. Clear definition of the level of participation [4, 16, 18, 29]
3. Enough diversity in the group of participants [14, 15]
4. Enough influence from minorities in a neighbourhood [14, 15]
5. A broader government goal as a compass for area development [20]
6. Enough institutional freedom to experiment [20, 21]
7. Using the dynamics in society as a catalyst for participation [20].

3 Results

Urban media can influence the experience, use and value of physical places in a city [8]. Smartphones enable us to bridge both time and place. Apps are contributing to new forms of experience within neighbourhoods and could contribute to social cohesion (e.g. bridging and bonding social capital [30]). In today's society, the poster on a façade is replaced by the interface of a smartphone [33]. Urban media are developed into more personal, time and place independent, and more responsive forms of media. We conducted semi-structured interviews with eight experts for identifying trends in urban media. We aimed to explore the influence of urban media trends on area development. *Since the experts were regarded as authorities within the field of urban development or urban media, we decided to list all key trends* in Table 1.

Table 1. Trends in urban media as indicated by field experts

Interviewee #	Platform society	User generated content	Use of image and video	Serious gaming	VR & AR	Tech actors in urban field
Interviewee 1	X					
Interviewee 2	X	X				
Interviewee 3	X	X	X			
Interviewee 4	X	X				
Interviewee 5	X	X				
Interviewee 6	X		X	X	X	
Interviewee 7	X	X				
Interviewee 8						X

3.1 Trend 1: Networked Individuals in a Platform Society

According to many of our interviewees, the networked society is shifting towards a platform society [33–35]. The process of networked individualism makes citizen more and more footloose. A citizen does not necessarily bind himself to his neighbourhood. The perception of a place can commence even if one doesn't actually know a place, or even has been to a place. Through the omnipresence of media, a form of hybrid space is developed. The use of a smartphone as a territory device magnifies this effect. This even makes the definition of new groups of people possible [8]. Most of the urban media on smartphones operate on a (online) platform. Van Dijck et al. [33] described this process as a shift towards a platform society. Helmond [35] speaks of 'platformification', in which societal, social, and economic life for major parts runs through platforms. Four main companies (Google, Amazon, Facebook and Apple) dominate the platform landscape. A downside of such platforms is the risk of creating so called filter bubbles [5], caused by recommender algorithms.

3.2 Trend 2: User Generated Content

Users generate all kinds of posts, textual or audio-visual, and share them via platforms such as YouTube and Instagram [36, 37]. User generated content is the fuel for smart cities. According to Kaplan and Haenlein [36], user generated content needs to fulfil three basic requirements in order to be considered as such:

1. It needs to be published either on a publicly accessible website or on a social networking site accessible to a selected group of people;
2. It needs to show a certain amount of creative effort;
3. It needs to have been created outside of professional routines and practices.

This enables the growth of urban media, the mining of citizen generated data, partly as a result of urban media use, is growing. User-generated content can be used as possibilities for citizens to influence their own living areas. It can also be used for knowledge production in political participation [37]. Furthermore, extensive analysis of user generated content, as described in the cockpit metaphor, makes policy-making possible whilst taking the ideas and interests of a large and diverse population into account that lives in a neighbourhood. When data is collected on a variety of topics and among a relevant group of people, a form of indirect citizen participation could be achieved.

3.3 Trend 3: The Growing Importance of Image and Video

Visual social media channels such as YouTube, Instagram and Snapchat are getting more popular [38]. What those channels have in common is their emphasis on pictures and video as their most important way of communication. Politicians, for example, discover its visual possibilities to more easily reach voters and show their faces, increasing social presence [36]. Facebook introduced the Facebook live function in April 2016, to keep track on the growing competitiveness of other platforms in the field of image and video [39]. YouTube channels of - mostly young - people, posting Vlogs

about their everyday lives on the street in their neighbourhoods, provide opportunities to create new public figures in neighbourhoods. Furthermore, the development of video screens in public spaces is remarkable in this account. Veenstra [40] shows the potential impact of using interactive displays in public spaces. Experiments of showing urban dashboards on public screens to create city services are promising in this regard.

3.4 Trend 4: Gamification and Serious Gaming

Today, an increasing number of games are designed for serious purposes [41]. There is an exponential growth in digital games in popular culture [42]. Serious games can be played in a wide variety of fields, often using simulations of real-world events, adopted with gaming characteristics. It is therefore providing players of a game with tools to gain more insights in fields of problems, mutual positions or even development tools [41, 43, 44]. Gaming for the purpose of training, strategizing and learning is already widely accepted. A step further would be to see if gaming could even be working predictively and for policy-making. This is still on debate within scientific literature [41].

We saw that one of the important characteristics of urban media is time and place independency, given by the use of smartphones. The same trend is recognizable within the development of serious gaming for city development. These forms of urban media are the topic of various studies that aim to show the possibilities for enhancing citizen participation in area development.

3.5 Trend 5: Virtual and Augmented Reality

A variety of applications using both virtual and augmented reality is currently being developed. Several studies show the potential of using those techniques in the process of urban planning [45]. The use of virtual worlds on mobile applications also proofed to be a suitable tool for stimulation citizen to participate in the process of urban planning [46]. Studies show a growing and wide variety of possibilities for the use of Virtual Reality Geographical Information Systems (VRGIS) and Augmented Reality Geographical Information Systems. All creating possibilities for smarter urban planning and citizen involvement in that process [42]. In 2016, the augmented reality game Pokémon Go showed an enormous impact on the use of public areas. This even led to prohibiting people to enter certain public areas for searching Pokémon [31, 32].

3.6 Trend 6: New Actors in Area Development

With the increase of smart city techniques, also new actors present themselves in the field of urban planning. Large scale area development, such as proposed by Google affiliated company Sidewalk labs in Toronto, are examples of such. Companies such as Cisco, IBM or Siemens that originate in sectors like ICT, Social Media or hardware development, now develop strategies for urban planning and city planning. Companies that do not have any rooted experience in these fields. Some experts in the field of urban planning consider this lack of historical awareness and knowledge on the process of urban planning, a dangerous development [10]. Especially since urban planning is considered a complex process [46]. Many of these actors tend to approach a city and

urban development in a more rational way, almost comparable to the traditional approaches of urban planning that dictated the planning discourse in the first half of the twentieth century [11]. This has already led to criticism of the development of smart cities for being too technocratic and top-down in orientation. This could result in a structural neglecting of citizens interests and ignoring their needs [1, 2, 47–49]. Reactions of the companies in describing strategies towards more citizen-focused strategies, do not provide a more citizen-focused form of urban planning in smart cities [49].

4 Analysis of Urban Media for Area Development

We carefully analyzed the aforementioned trends in relation to the defined aspects of successful urban development in existing neighbourhoods. This analysis took place by developing a confrontation matrix where the trends were assessed on the found aspects of area development. The analysis resulted in either a potential positive effect, a potential negative effect, or no expected effect at all. While the analysis is not yet validated with large scale empirical data we encourage further research. The analysis is displayed in Tables 2 and 3 and shows an overview of expected value based on theoretical and expert assumptions that were found in the research.

Table 2. Analysis trend 1–3.

	Platform-society	Citizen generated data	Image and video
Own participation	Positive effect expected	No great influence expected	Positive effect expected
	Platforms lower the barriers for citizens to participate		New target groups can be reached through video platforms. These are low barrier options to participate
Clear role of government	No great influence expected	Negative effect expected	No great influence expected
		Ethical dilemmas make the extensive use of data risky	
Diversity	Negative effect expected	Positive effect expected	Positive effect expected
	Because of the effect of filter bubbles on platforms, groups tend to develop in a homogenous way	When using data analytics, data and opinions of every target group can be taken into account	New target groups can be reached through video platforms
Influence by minorities	Negative effect expected	Positive effect expected	Positive effect expected
	Because of the homogenous development, minorities can be in danger of not being heard	When using data analytics, data and opinions of every target group can be taken into account	New target groups can be reached through video platforms

(*continued*)

Table 2. (*continued*)

	Platform-society	Citizen generated data	Image and video
Widely set goals by government	No great influence expected	No great influence expected	No great influence expected
Room for experimentation	Positive effect expected	No great influence expected	No great influence expected
	Platforms provide an opportunity for exchanging ideas and improve experimental development		
Dynamics in society	Positive effect expected	Positive effect expected	No great influence expected
	Platforms provide opportunities to exchange ideas and benefit from energy in society	Predictive analysis of data, can identify the dynamics of society	

Table 3. Analysis trend 4–6

	Serious gaming	VR/AR	New actors in area development
Own participation	Positive effect expected	No great influence expected	Negative effect expected
	Serious gaming stimulates participation of otherwise less - interested target group		New actors lack insights and rooting in urban planning methods. They can have a poorly developed historical awareness. Often city development is approached in a rationalised, technocratic manner. This does not support clear and 'free' citizen participation
Clear role of government	Positive effect expected	No great influence expected	Negative effect expected
	Role playing elements show clear division of roles		In some cases, new actors make contracts with local governments. This could harm the needed transparency and clear choice of governmental role

(*continued*)

Table 3. (*continued*)

	Serious gaming	VR/AR	New actors in area development
Diversity	Positive effect expected	No great influence expected	Negative effect expected
	Serious games can provide insights in opposing angles and show that target groups perhaps are forgotten		The of lack insights and rooting in urban planning methods does not benefit the 'inefficient' use of diverse public
Influence by minorities	Positive effect expected	Positive effect expected	Negative effect expected
	Serious games provide possibilities to generate insights in opposing angles. Also it lifts support for opposing views	VR and AR generate possibilities to show area development through the eyes of someone else. Therefor also generating support for minorities, like disabled people	The lack of insights and rooting in urban planning methods does not benefit the 'inefficient' use of diverse public. This could be dangerous for the need of involving minorities
Widely set goals by government	No great influence expected	No great influence expected	No great influence expected
Room for experimentation	Positive effect expected	Positive effect expected	Negative effect expected
	Serious games provide possibilities for experiments and test them in simulated situations	VR and AR generate possibilities for showing the effect of experiments and adjust them endlessly	The lack of insights and rooting in urban planning methods does not always fit to an experimental approach to urban planning
Dynamics in society	Positive effect expected	Positive effect expected	Positive effect expected
	Serious games thrive on enthusiasm. This functions better when acting on the dynamics of society	VR and AR can generate enthusiasm by creating possibilities to envision endless number of possible future developments in neighbourhoods	New actors often have a good antenna for finding the dynamics in society. This could benefit initiatives for neighbourhood development that thrives on these dynamics

5 Discussion

It can be concluded that the six main trends we defined regarding the development of urban media, each show their own impact on citizen participation in urban planning. Some of the identified trends could even have a mutually amplifying effect, which makes the contribution of urban media even more significant to urban planning. The relatively new actors in urban planning that are rooted in the world of ICTs, gain lots of criticism in their technocratic role in the development of smart cities. Since they do not have a background in urban planning these new actors may have a negative impact on citizen involvement in urban planning.

Various limitations of our research have to be mentioned here. First, we focused completely on urban media trends that were identified from literature and experts. This means that we did not explore or revisited the body of knowledge regarding all kinds of earlier city participation technologies such as online forums, open data initiatives, web planning tools, cloud services and so on. A second limitation, raised here, is that our interviewees, that we considered as experts in this field, were exclusively from the Netherlands. This potentially limits the generalizability of the findings for other countries where the trends could not be that strong as in a country with the highest level of internet access. Urban media shows some remarkable opportunities for city planning in local neighbourhoods but has to be applied with care. The analysis in this article showed that some functions are better supported than others. And solely the existence of urban media does not solve the lack of interest in participation. Yet we have to find those specific configurations and strategies that enhance participation, based on hard work of people and creating valuable relationships. In that sense, urban media is maybe an old wine in a new barrel.

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Genres of Participation in Social Networking Systems: A Study of the 2017 Norwegian Parliamentary Election

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Abstract. Norwegian political parties have used the Internet for campaigning since 2001. In 2009 all the parties represented in parliament experimented with social media, and in 2013 social media had become an important and integrated part of the parliamentary election campaign. This paper is a continuation of studies conducted in 2009 and 2013 on the communication genres used by political parties and voters during the campaign. In 2009, a genre system for political communication was emerging. In 2013 the genre system was more established and professionalised. This paper presents findings from the latest election in 2017, where there was concerns that the polarizing effects of Brexit, right-wing populism and the Trump campaign would influence online political communication during the campaign. The findings indicate that polarization is indeed part of the picture, but mostly when we view social media in isolation. The paper concludes by discussing the implications for democracy and the public sphere.

Keywords: eParticipation · Online campaigning · Social networking systems
Social media · Genre theory · Norway

1 Introduction

The media landscape for political communication has never been as complicated as it is today. Fake news, bots, polarization, right- (and left-) wing activism, echo chambers and a plethora of new online news sources with an agenda has been highly debated in recent years [1–3]. After the election of Barack Obama in 2008 and the Arab spring in 2009–2010, scholars and media experts were highly optimistic about the democratic potential of the Internet and social media, talking about a new dawn for enlightened debate and freedom of speech. This optimism is now slowly turning to a more pessimistic, or perhaps more balanced, view of the relationship between social media and democracy following the election of US president Donald Trump, the Brexit referendum and other cases [3].

While a lot of this is centred around the American context, there is also research on the Scandinavian countries, for example a study of the right-wing Sweden democrats, [4], or more general studies of campaigning and participation in social media, i.e. [5, 6]. A common variable in many of these examples seems to be populism, where certain

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prominent individuals use social media to circumvent traditional media channels in order to present a popular and direct message to the people [4].

The media channels themselves might contribute, but this trend is resting on real societal challenges. A special issue of the journal *American Ethnologist* examined the Brexit referendum and Trump campaigns, both of which have been framed as social media campaigns. The articles point to several underlying explanations such as increased inequality in society, leading to increased nationalism, concerns about immigration and a sudden rise in anti-globalization sentiment [7]. Data from the *European Social Survey*[1] shows a general lack of trust in traditional media, political parties and political institutions which could further help explain the rise of populist politicians using social media to reach out to disgruntled citizens. There are changes going on in the public sphere, and public opinion is at the same time both divided and polarized, but also empowered, and more research is needed to understand these changes [8].

In Norway, the *power and democracy* project was already in 2003 concerned about a decline in representative democracy, with voters moving between parties depending on single issues and media attention [9]. While Norwegians in general have somewhat higher trust in both media and political institutions [10], Norwegian politicians are signalling that they want more citizen dialogue and user-involvement in the political process [11], and they are increasingly attempting to achieve this through social networking systems (SNS') and other digital communication channels in order to reach out and communicate directly with voters [12].

This paper responds to Mindus' [8] call for more research on the current changes to the public sphere by examining communication genres in the 2017 Norwegian parliamentary election. Following the same research design as studies of the 2009 and 2013 elections, we seek to answer the following research questions:

RQ1: Which genres were used during the 2017 election campaign?
RQ2: Given the events of recent years, have Norwegian political communication changed compared to previous campaigns?

The rest of the paper is structured as follows: Sect. 2 provides an overview of related research, specifically on the topics of democracy, the public sphere and genre theory, which informs the findings and discussion sections. Section 3 presents the research approach of the study, and Sects. 4 and 5 present the findings and conclusions with some possible directions for future research.

2 Related Research

2.1 Theoretical Lens: Democracy, Participation and the Public Sphere

Democracy can be conceptualized in a number of ways [13]. There are several models of democracy in literature defining everything from direct democracies to the parliamentary/representative democracy we find in most western countries today [14].

[1] http://www.europeansocialsurvey.org/data/.

This paper applies the traditional representative model, where our role as citizens is to vote in elections and participate in societal debate as members of an informed public, in line with the writings of Habermas [15] and Dewey [16].

Habermas' concept of the public sphere as the "domain in social life in which such a thing as public opinion can be formed" [15] (p. 261) has often been used as theoretical lens for studies of online democracy, as it can be understood as a mediating layer between politicians and citizens where "the interaction between citizens, civil society, and the state, communicating through the public sphere, that ensures that the balance between stability and social change is maintained" [17]. However, to use the concept in today's fragmented media landscape, we need to discuss not one, but several overlapping public spheres[2]. Trenz and Eder [18] presents four different archetypes of public sphere; discourse, political protest, political campaigning, or consensus. We can talk about a mainstream public sphere in mainstream media and politics, but with SNS', alternative and marginalised groups can have a voice [19], creating their own "counter" public spheres [20]. An effective protest-based or counter public sphere should follow three conditions: (1) The intention of protest should be to address issues relevant to the democratic community. (2) Protest should provide an alternative to, or new information for, the mainstream discourse. (3) It should not promote discourses incompatible with the public sphere principle of inclusion, or "aim to force the alteration of a decision" [21]. In SNS', the lines might be even more blurred, due to "trench warfare" dynamics where confirming and conflicting arguments both tend to reinforce existing attitudes [22]. Further, those with a strong interest in politics tend to seek out and engage with a variety of political news sources [23]. The findings and discussion will illustrate how the 2017 election can be interpreted as both campaign and counter public sphere at the same time.

2.2 Analytical Lens: Genre Theory

A genre can be defined as "a conventional category of discourse based in large-scale typification of rhetorical action" [24]. Genre theory can be applied to classify communication practices, and has been applied to several eParticipation studies for classification and understanding [25–29], as well as for modelling purposes [30]. Genre theory provides us with a lens for detailed understanding of political communication, beyond the observation of technological functionality [31]. Genres are recognized by having similar form and content, where form refers to physical and linguistic features, and content to themes and topics of the genre [32]. As digital media has become more common, functionality of the medium delivering the genre has been added as a third construct [33]. Genres can be defined by examining form, functionality and content, by using the 5w1h-method [34, 35]:

Where tells us where the communication takes. *Why* explains the purpose of the genre. *When* refers to the time where communication takes place. *Who* defines the actors involved in communication, the sender and receiver of the genre. *What* is the content of the genre and *How* describes the technical needs for delivery of the genre.

[2] For in-depth discussions on the public sphere of today, see f.ex. the writings of Nancy Fraser.

The genres used by a given community can be seen as a genre system [35] and this system can reveal a "rich and varied array of communicative practices" shaped by community members in response to norms, events, time pressure and media capabilities [31]. Genres are useful for studying communication in SNS', as the introduction of new media over time often leads to new communication practices which genre theory allows us to map and analyze [27]. Genre theory, including the technological functionality of the medium the genre is enacted within, allows us to better understand the interplay between the social and the technical [33].

3 Research Approach

The objective of this paper is to examine how the genre system used by Norwegian political parties has evolved since the last election and to discuss this considering current trends in political communication as presented in the introduction. The study was conducted using a qualitative, interpretive approach.

Data Collection: Data for this study has been collected over three periods: The elections of 2009, 2013 and 2017. Data for the 2009 study was collected through semi-structured interviews with representatives from the seven political parties that were represented in the parliament before the election (Socialist Left, Labor, Center Party, Liberals, Christian people's party, Conservatives and the Progress Party). In 2013 and 2017, follow-up interviews were done electronically to confirm findings from 2009. Further, SNS content (posts, comments and interactions from the pages of the political parties) during the main campaign period in June to election day in September, has been archived and analyzed using Nvivo and Tableau software. In addition, statistics from Likealyzer.com, the European Social Survey, and the polling company TNS Gallup has been used to examine trust in media and politics.

Data Analysis: The combination of interviews and SNS content made it possible to compare what informants say with what we can observe happening. This is used to map the genre system in SNS political communication. For this study, only Facebook data has been analyzed, since Facebook is by far the most used channel in Norwegian politics. The genre systems have been analyzed using the 5W1H method presented in Sect. 2.2. Of the around 6000 posts collected, a selection has been coded until saturation (no new genres emerging from further study). When no new genres were identified, the remainders of the posts were quickly scanned to see which genre category they matched. Due to space limitations, the findings are presented using the "form/function/content" constructs [31, 32].

4 Findings

4.1 Summary of Findings, 2009 and 2013 Elections

The interviews made in 2009 revealed that the political parties agreed on three objectives for political communication in SNS': Dialogue with citizens, contributions

from citizens, and involvement in party activities. When asked if these objectives remained the same, the parties agreed in 2013. In 2017, they still agreed that these were the overall objectives, but several respondents pointed out that they have evolved and developed a more fine-grained set of strategies, objectives and goals for different channels. In terms of channel use, blogs were popular in 2009, almost gone in 2013. Facebook emerged as the most important channel, and there were some experiments with Instagram. One of the parties said SNS communication had been moved from communications to marketing. The objectives are presented in Table 1.

Table 1. Political party objectives for SNS participation

Objective	Purpose	Form	Content/functionality
Dialogue	Involve citizens in debate about political issues	Encourage dialogue. Open and personal language. Citizen-generated content	Conversation between citizens and politicians
Contribution	Knowledge about citizen concerns	Q&A sessions, invite voters to share their stories	Encourage contributions and questions from voters
Involvement	Raise funds. Get people to volunteer	Competitions, membership forms, information and links to registration sites etc.	Competitions, theme sites, cross-publication

In 2009, seven genres were identified:

Policy comments are comments from citizens on party policy. These come in many forms: Wall or discussion posts on Facebook, in Twitter messages and blog comments.

Calls for action mainly originate with the party but are often distributed through citizens supporting the party making the call. This genre incorporates calls for volunteers, competitions and calls for action in specific cases. Several parties have created Facebook groups for specific parts of their policy. Calls are presented in video, with links to the video posted to Facebook and Twitter.

The **Q&A** genre is perhaps the genre that citizens are least satisfied with. Many questions on Facebook walls remain unanswered, or are answered unsatisfactorily. Some citizens ask why politicians bother having a presence in SNS when they do not engage in conversations with citizens.

Appeals to the party are similar to policy comments. The difference is that where policy comments reflect directly on the party's political program, appeals are more specific, asking what the party intends to do with this or that matter. There is some frustration among citizens when these are not answered.

Greeting is an interesting genre. At his birthday, Prime Minister Jens Stoltenberg received hundreds of greetings wishing him a happy birthday. In 2013, we saw the sme related to birthdays and other personal occasions. This genre, while not directly

political, could be seen as narrowing the gap between politician and citizen, creating a sense of personal attachment.

Personal accounts are mainly found in blogs, as response to politicians asking for the stories of individual citizens. The most interesting example is where the minister of health asks for people's stories as input to a major health reform. In 2013, this genre was still present, but had mostly evolved so that personal accounts were incorporated into other genres such as debate and policy comments.

Video responses from citizens are rare, but some examples exist. These are typically posted as responses to competitions where parties ask citizens to contribute. There are also responses between parties, where video is used in a similar manner to newspaper debates, and responses between politicians belonging to the same party. This genre disappeared in 2013.

In 2013 five new genres emerged:

Debate was not present in 2009, perhaps because overall activity was low. In 2013 there was much more activity in SNS', and this led to several rational debates on several policy issues.

Support and **non-support** Citizens showed their support ("steady course. Four new years of labour") or lack of support ("about time someone else takes the wheel") for the party.

Disgruntlement is like non-support, but different in form. Here we found Sarcastic comments about the party, unpleasant comments about the party and its politicians.

Link as genre simply consists of links to news articles and other sources. This is often accompanied by a short statement ("Do something about this, please!") or question ("Why is this allowed/not allowed"?). Linking to content to support a position shows the richness of digital communication, and the easy by which relevant information can made available to people.

In summary, the 2009 election showed an emerging genre system for SNS campaigning, but there were many voters who were unhappy with a lack of response from the parties. Responses to party calls for input on specific issues received a lot more comments than other politician-initiated genres, indicating that citizens want to be heard and feel that their input is used for something if they are to participate. 2013 introduced several new genres, indicating that SNS' were moving towards a richer genre system for communication between citizens and parties. The parties had listened and were much quicker to reply in 2013. They also asked for input on a wide range of policy issues and received hundreds of replies. The main challenge in 2013 was that the form (language use) of genres varied greatly. Citizens communicated with a language ranging from highly informal, with lots of typing errors, exclamation marks and capital letters to the formal language more common in political communication, and the border between a post or comment coded as "debate" and one coded as "disgruntlement" was sometimes quite blurry.

4.2 Genre System 2017 Election

The 2017 election saw some interesting variations from the previous two campaigns. While 2013 gave the impression that the political parties were moving towards a form of "politics 2.0", focusing on interaction and feedback from voters [36], this is less visible in 2017, with most parties being more focused on getting the message out to the public. The political parties are heavy users of the following genres:

We want to is the most commonly used genre from all the parties. The content is directly related to the party program, with statements such as "we want to [do something] because [of some reason]".
We have is only used by the current governing parties. In this genre, the ruling parties present their accomplishments from the last parliamentary session. Sometimes accompanied by the phrase "you know what you have, do you dare vote for something untested". Video and images are frequently used.
Non-support is frequently used by most parties. In this genre the party attacks the policy and policy consequences of other parties. Political parties have always done this, but the tone is harder than in previous elections. Making fun of the other parties has become a lot more common, as exemplified by the Conservative's image of sun lotion with the text "don't be red this summer, vote Conservative"
Slogan is related to we want to, but in place of concrete policy issues and references to the party program the slogan is more idealistic in nature and is not supported by arguments as to why the statement is true: "We are the best party for young people!" or "Vote for us if you want change"
Personal accounts come in two forms: One is promoting popular politicians in the party, the other is "interviews" with typical voters from large voter groups.
Contribute is where parties ask voters to participate. This can be in the form of Q&A sessions or, more commonly, by asking voters to register for updates, become members of the party or act to support the party.
Society & Context involves parties posting links and updates about current affairs they somehow believe reflects on the values and ideology of the party. For example, the greens post quite a lot about global warming and the conservatives wish people happy pride or post content about the importance of reading.
Experiments is a genre where parties try out different formats of communication, using podcasts or live streaming, giving someone a GoPro to document a day in their lives and similar. Not all parties try this, and the genre is not frequently used. However, this is a sign that there is still some experimentation going on in SNS'.

The citizens commenting and posting use the following genres:

Non-support and **Support** are popular both in comments and posts created by users, even more in 2017 than in 2013.
Greetings is a popular way of showing support, as it was in 2013. Popular politicians celebrating their birthday or other major life event get a lot of congratulations also in 2017.
Disgruntlement is another genre that emerged in 2013 and is sadly a growing genre. There is a lot of sarcasm and outright hostility towards most of the parties. In

fact, most comments and user posts fall into categories arguing for or against the party. This can be interpreted as a sign that polarization is occurring also in Norwegian politics.

Debate and **policy comments** are present, but very little compared to the three genres above. There are a few examples of users attempting to start a debate based on evidence, facts and arguments, but most often these posts are taken over by non-supportive or disgruntled comments.

Genres Have Common form and Functionality

It is quite clear that the parties are done experimenting and are relying more on data and statistics in 2017. The genres all have similar form and functionality: Posts are short, most are within around 200 words or less. There is a video, link or image attached to almost all of them and each post focuses on one simple idea or issue from the party program. Looking at the timeline of posts, the parties have more or less the same frequency of posting (2–3 posts every few days, growing to 8–10 posts closer to election day).

Engagement and Effects of Genres

Putting a face on policy seems to become more and more important, as posts with the name of popular politicians are frequent in the top 10 posts receiving engagement from voters. Other genres creating engagement include *we want to, we have, and non-support*. However, the clearest observation is that popular politicians create a lot of engagement, both supportive and non-supportive in form. While several parties make some attempts at two-way communication with citizens, for example by creating monthly Q & A sessions, asking for input on specific policy issues etc., none of these ranks high in the list of posts receiving a lot of engagement. Likealyzer is an online service that analyses Facebook pages. Analysing the Norwegian political parties using this tool shows that the parties could improve when it comes to debate. With a response rate varying between 20 and 44%, and little interaction with other pages, the Likealyzer statistics strengthens the impression that the political parties view SNS more as a one-way campaign tool than a channel for interaction and debate. Facebook in 2017 is more about marketing the party's program than about dialogue, and the voters play along, acting like supporters in a game of football.

Themes and topics receiving engagement vary between parties, depending on the issues they have chosen to put high on the agenda. However, some themes create a lot of engagement across party lines. As we have seen in other countries, themes of inequality, social dumping and people being left behind are common, but blame is placed differently depending on people's political beliefs. Immigration is one issue that has really contributed to polarization, especially following the rise of asylum seekers from Syria in 2015. There is also a lot of criticism of globalisation and the EU. A lot of people seem to blame increasing inequality on these factors. Others, especially the far-left opposition, instead blame the ruling government's policies. As the data collection tool anonymises the author of posts and comments, it is unclear if this is caused by a few very active users, or if this is a larger trend.

4.3 Growth in SNS Use – How Effective Is Facebook for Reaching Out?

There is little doubt that Social networks are increasingly important as a communication channel for political parties. Most of the parties have seen a massive growth from 200–6000 followers in 2009, up to 16–160.000 followers in 2017. The media use survey from TNS Gallup confirms this, showing that TV, newspapers and Social networks are equally important when citizens seek information related to politics. Two elections ago, TV and newspapers scored a lot higher than any digital medium. Figure 1 shows the growth in Facebook followers from 2009–2017, and the number of votes the parties received in the three elections.

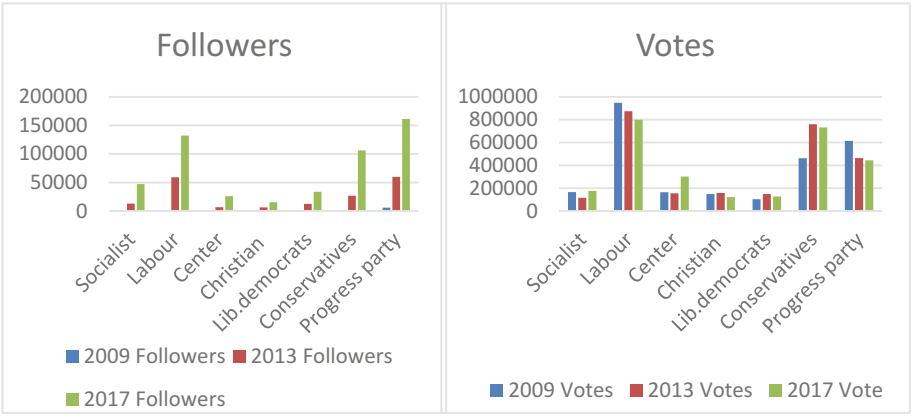

Fig. 1. Follower growth and votes received 2009–2017

There seems to be little if any correlation between the number of votes received and the increase in followers. The progress party is by far the most popular Facebook party, but also the party with the largest drop in votes from 2009–2013. Labour has lost more than 100.000 votes in the same period, while gaining an equal number of followers. The Center party doubled their vote from 2013 to 2017, but only have 25.000 Facebook followers. On the other hand, the green party[3] was elected to parliament in 2013 and cited social networks as an important factor. However, with 60.000 followers they are the fourth largest party on Facebook, but still has less than 4% of the total vote. Finally, the numbers from both 2013 and 2017 seem to confirm an increased focus on person over party. The leaders of the three largest parties (Labour, Conservatives, Progress party) all have more followers than their respective parties. Prime minister Erna Solberg has almost twice the number of followers of the Conservative party she belongs to.

[3] Excluded from the figures, as they were not in parliament 2009.

5 Discussion – Implications for the Public Sphere

The populist rhetoric from other countries and campaigns seems to have influenced communication in the Norwegian election of 2017. Political parties are less eager in seeking two-way communication, and even when they do, voters seem more concerned with showing their support or non-support of the parties. The topics and issues discussed, such as immigration, globalization and inequality have been on the agenda before, but the tone of the conversation is more aggressive than it has been, and polarization seems to be a factor in Norwegian political communication (at least on Facebook). This study supports the findings of Dubois [23], showing that SNS does not equal echo chambers, as a lot of the comments given to all the political parties are negative.

Examining the election campaign in SNS' using democracy models [14] and the public sphere [15, 18], SNS seem to be falling in line with traditional representative democracy, as the attempts at two-way communication from the past elections is less visible today. SNS have become yet another channel where parties seek to convince voters to vote for them. As for the other part of representative democracy, a public engaging in reasoned debate, there is little evidence of that in the genre system of the Norwegian political parties, despite a few efforts at reasoned debate. Instead, we see a form of hybrid public sphere. A mix of what Trenz and Eder [18] would call a consensus-based and protest-based public sphere. This supports other research stating that echo chambers are not as much of a problem as previously thought [23], but does little to alleviate the fears that politics is becoming increasingly polarised.

6 Conclusion

A genre system for political campaigning emerged in 2009, and in 2013 this had matured significantly, with more genres, more users and experiments with two-way communication. In 2017, however, SNS' are mostly used as a one-way communication tool, with participation mostly limited to cheering or opposing the statements from the parties, confirming that Norway has not been immune to the issues and events happening in other countries. This paper points to several possibilities for future research: Data-driven methods [37] could be applied for a more detailed analysis of each and every comment, post and engagement, in order to quantify the findings of this content analysis. An in-depth (network) analysis of the people being active and commenting would help understand if the activity in SNS' is just a few people being very active, or if this is a general societal trend, especially if this was linked to other analyses of people's opinions and actions outside of social networks. This type of research should also examine the broader social world, to identify any differences between SNS' and real-world conversations. Finally, broader studies of sentiment towards issues such as immigration and globalisation should be carried out, in order to better understand the underlying motivations and processes driving these issues to the forefront.

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The State of E-local Participation in Kampala Capital City Authority in Uganda: A Reality or Deception?

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Abstract. Because of growing demands and pressures from citizens, political representatives and institutions of governments are increasingly opting for new forms of participation. In other words, a mix of methods is utilised to complement representative participation and city administration. In Uganda, a number of local political representatives: Councilors, Lower level Mayors and Lord Mayor use online participatory instruments; social media platforms: Facebook, WhatsApp, and Twitter to connect with citizens in Kampala capital city authority. However, critical analysis of online participatory instruments for information giving and citizen engagement seems to be lacking. In this regard, a number of possible research questions to critically interrogate are posed. Is the new invited space a reaction to the invited bottom up participation? What forms of digital participatory spaces does Kampala Capital City Authority use to disclose information on its operations? What is the mix of offline- and online channels (blended participation) do local political representatives use to connect with electorates? Is this more for planning or for monitoring purposes. To answer these questions, both quantitative data (survey) and qualitative interview is used.

Keywords: Local E-participation · Online and offline instruments
Local representation and electorate engagement

1 Introduction

The disconnection of local political representatives from electorates in the processes of making of social, economic and political decisions is increasingly growing in representative democracies around the globe [1]. In fact, Younger democracies are often regarded as having only degenerated into purely electoral democracies. But the older democracies also show symptoms of a participatory and legitimisation crisis of the political system. For instance, globally, electoral representative democracies are highly criticised. They characterise high rates of voter apathy, cynicism and disinterest in conventional political [2].

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In addition, political parties in representative democracies lack political debates in which, for instance political parties are often seen as empty railway stations or abandoned pizzas, in which political debates are lacking (see for this metaphors used by Touraine) [3, 4]. Here a trend towards right wing populist party is obvious [5].

However, as a result of increasing deterioration of conventional participation in representative democracies and deficiencies of good governance [6]. In recent decades, most of the representative governments were confronted with strong protest and demonstrations and bottom up participation in the invited spaces [7–9]. Political systems reacted and implemented new invited spaces in form of referendums, round tables or forums for the purposes of engaging citizens in the making of social, economic and political decisions. However, some of these new experiments were found being dominated by political parties and formal institutions. In this case, the people were still not satisfied, and found their own channels to express their interest using *invented spaces* as an answer to this hierarchically dominated intervention. New forms of protest and participation were developed as a kind of public counterweight to existing structures. They were used to challenge existing power structures and dominance by the old ruling elites [7].

In Uganda particularly in urban local governments, local political representatives and electorates as well as experts in administration are using online participatory instruments to engage each other in social, economic and political decision-making. A number of online participatory instruments such as twitter, Face-book, and Instagram etc. are already in place for which the local electorates engage political leaders and technical wings in public institutions. This paper therefore presents the state of E-local participation in Kampala Capital City Authority (KCCA) in Uganda. The paper focuses on interrogating questions: what are the forms of digital and analogue spaces KCCA uses to disclose information and to discuss? What are online channels that local political representatives use to engage their electorates? How important are these online participatory instruments? Is it more deliberative or demonstrative participation? Is the new invited space a reaction towards protest (invented space) or is it provoking new forms of protest?

2 Participatory Rhombus in Uganda

Participation is an act of citizen involvement of citizens the aim to influence political decision-making [10, 11]. Participatory Rhombus localises this engagement in four different spheres of politics. All four spheres exist in the digital online and offline worlds. These include; participation in representative democracy, participation in direct democracy, deliberative participation and demonstrative participation. Below, the participatory rhombus explains these and their location in the “invented space” as bottom up participation and “invited” spaces as a platform built by government from above’. In the dominating representative sphere of politics, participation focuses on the elected members of Parliament and the Executive. Here elections and voting are important, as well as direct contacts with politician’s political party membership etc. In multiethnic Uganda after independence, the multiparty political system was facing conflicts. After years of civil war and dictatorship, the new president Museveni

introduced a No-Party System with a kind of inner-party democratic competition and a strong president. This concept lost its appeal with the winds of change in 1989.

Nevertheless, with the dominating president, Uganda still seems to be a de facto one party system and a liberal electoral democracy. At the local level, elections are partially non-existent, for instance, lower local councils: village, parish and women council representatives, but the representatives often act in a kind of competitive, neo-patrimonial clientelistic system. The direct contact between the councilors, administration and the citizen is crucial and it was extended in recent years by new online channels. Most participatory instruments focus on these two groups. Beside important strategies for information (web-portals, electronic newsletters), new online instruments become more an element of communication between administration as well as politicians and citizen. Here the mobile telephone, SMS is an important channel for top down and bottom up information and communication.

Direct democratic action, which means the vote on thematic issues, including a vote in a numeric democracy only existed at the national level. Here two important referendums were important. One end up in favour of the no party system and one - some years later- in favour of the new multiparty system. Both showed the strong influence of the ruling party and the president in referendums [12]. Sub-national off-line direct democratic participation, such as local referendums and initiatives do not exist. Online instrument in this regard include forms of participatory budgeting, where it can be voted for suggestions. In general, citizen can react in posting different messages towards administration and politicians. Here this was enabled by instruments incorporating an online comments-function for citizen, as well as by social media forums using Facebook or Twitter. Complaint chat rooms as well as e-petitions do not exist, but social media and messenger are used instead (Fig. 1).

At the national as well as at the local level government of Uganda included the different deliberative platforms called Baraza which allowed information but also discussion between policymakers, development partners and citizen. The quality of deliberation is often dependent on the willingness of the administration and politicians allowing open and free discussions. In the online deliberation the conduction of narrated unguided discussion forums allow a broader deliberation. But regular electronic town hall meetings do not exist. Because of this low deliberative quality, most of the direct democratic and the deliberative participation were not a reflexive deliberation based on good arguments, but more an expressive demonstrative participation. So this engagement can be ascribed to the fourth sphere of demonstrative participation.

Beside this form of expressive participation, in Uganda demonstration on the streets often are organized by special interest groups such as doctors and protesting in favour of higher salaries and better working conditions etc. and environmentalists who often demonstrate against government intentions of selling off of protected natural forests and watersheds. Similarly, the unemployed youth groups have often demonstrated at the parliament against corruptions and lack of welfare and employment as well as "walk to work" street protests by the opposition and citizens against inflation and skyrocketing cost of living in Uganda in between 2010 and 2012.

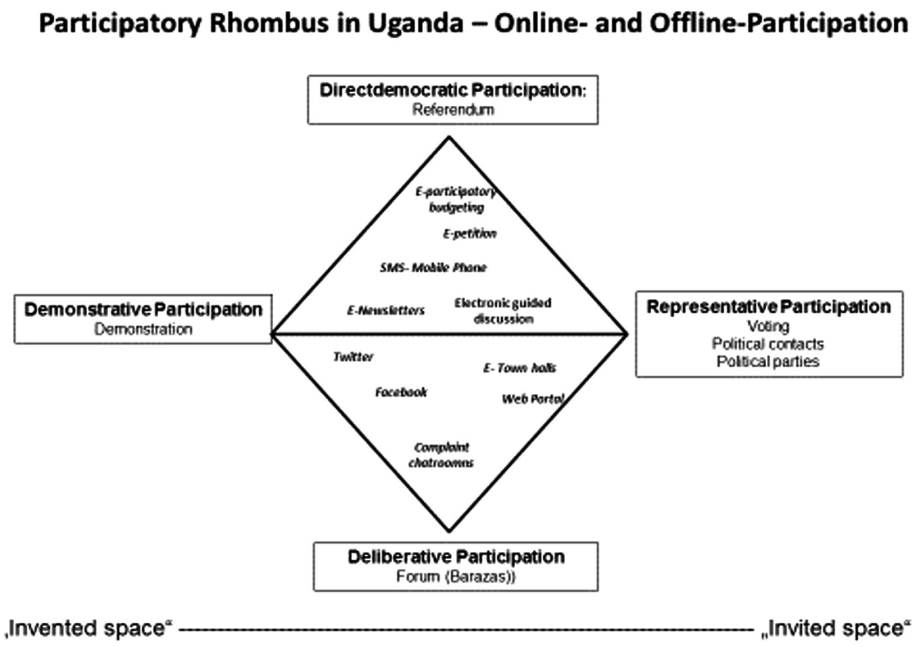

Fig. 1. Participatory Rhombus in Uganda - online and offline participation [7]

3 Politicians and Administrations Perspective: Empirical Findings

This paper uses data generated from a questionnaire survey which was carried out in Kampala city from January to June in 2017 on local political representatives (Councilors) in local urban governments. A total number of 157 local representatives were given a questionnaire to respond to questions on online participation in Kampala city authority. They were considered because of their fair knowledge on use of online participatory instruments. Experts in the administration were contacted to establish the online participatory instruments and administrative innovations used in place. Interviews were conducted within the directorate of communication and research. The information from interviews reveals that there are a number of online instruments and administrative innovations: complaint management and monitoring tools, participatory budgeting, mobile short text messages (SMS), Municipal/City Facebook/WhatsApp, web-portals and electronic newsletters etc. They are used for inclusion of different stakeholders in city projects, for instance, “visit Kampala”, “Kampala for climate change”, “urban faming”, and “urban infrastructure”, especially for monitoring and management of complaints about infrastructure and service delivery in the city etc.

The information from online instruments is interlinked to the relevant directorates for utilisation, management and planning, which in terms of policy implications facilitates the formulation of sustainable, effective and efficient policies as well as planning and monitoring operations of the city authority. The generated data from a

questionnaire survey was analysed using SPSS package and Microsoft-excel. Thus, below is the presentation of findings in a graphic form. They show the importance of online participatory instruments, and online instruments in which local political representatives, citizens and administrators participate in or they use to participate in political and administrative operations of city (see, Figs. 2 and 3), and the effects of online enabled instruments on quality and quantity of information in local politics and administration (see, Fig. 4).

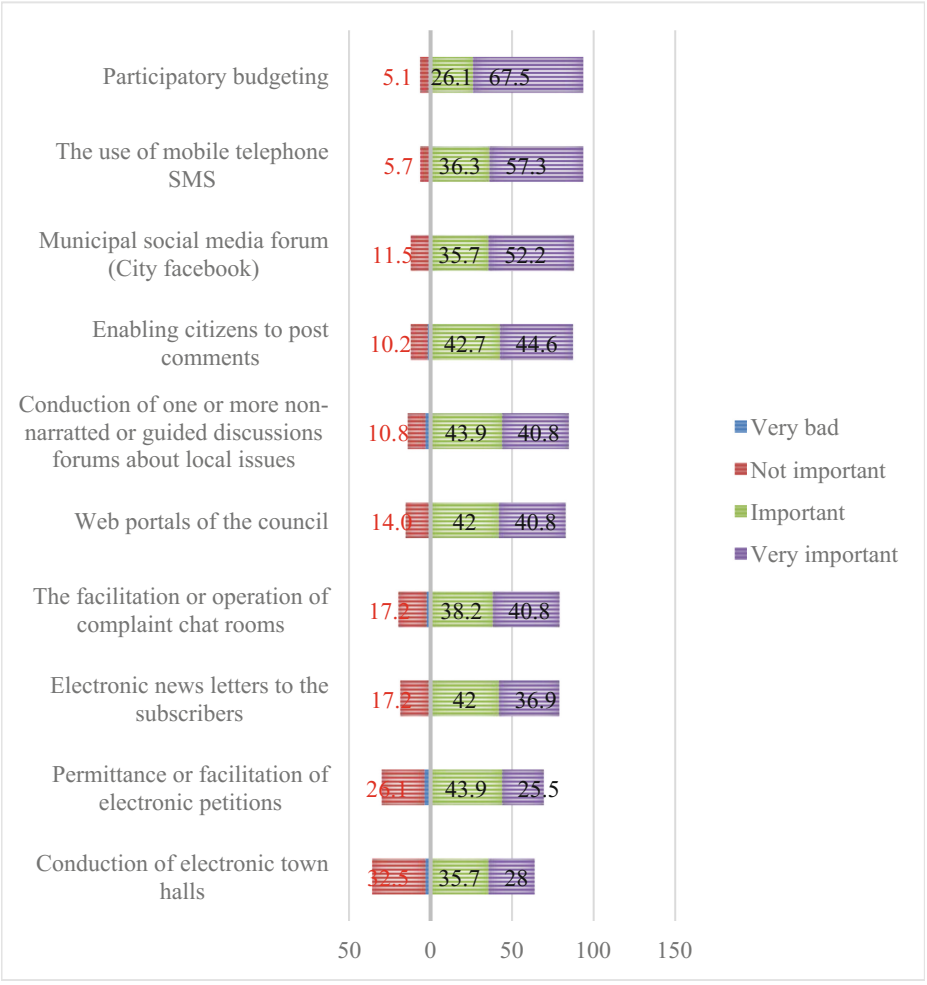

Fig. 2. Importance of online participatory instruments used by Kampala Capital City Authority (KCCA) *Source: Own research 2017*

How important are online participatory instruments? The findings of the study indicate that a highest proportion of respondents (42%) reveal that electronic

newsletters are important online instruments, while (36.9%) reveal them as very important. On the other hand, respondents (17.2%) find newsletters not important and only a small portion (1.3%) indicate that electronic newsletters are very bad for participation. In addition, slightly above every four in ten (42.0%) of responses reveal that web portals are important, while almost a similar figure (40.8%) show that web portals are very important, and only (14%) note that they are not important.

Furthermore, slightly above every five in ten (52.2%) of respondents reveal that the use of Municipal/city Facebook or WhatsApp is very important for participation in the city, while (35.7%) further reveal that Municipal/city Facebook/WhatsApp is important and only (11.5%) of responses find Facebook/WhatsApp not important. With regard to mobile telephone (SMS), a smaller portion of respondents (0.6%) reveal that they (SMS) are very bad, and only (5.7%) of responses find it (SMS) not important. On the other hand, portion of slightly above every three in ten (36.3%) of respondents show that the use of mobile telephone (SMS) is important, and a significant majority of responses (57.3%) reveal that the uses of mobile telephone (SMS) is very important in politics and administration of the city authority.

The posting of comments is very bad as revealed by a small number of respondents (1.9%), and about (10.2%) of responses find it not important. While on the other hand, respondents slightly above every four in ten (42.7%) indicate that enabling of citizens to post comments is important, and majority respondents (44.6%) indicate that it is very important.

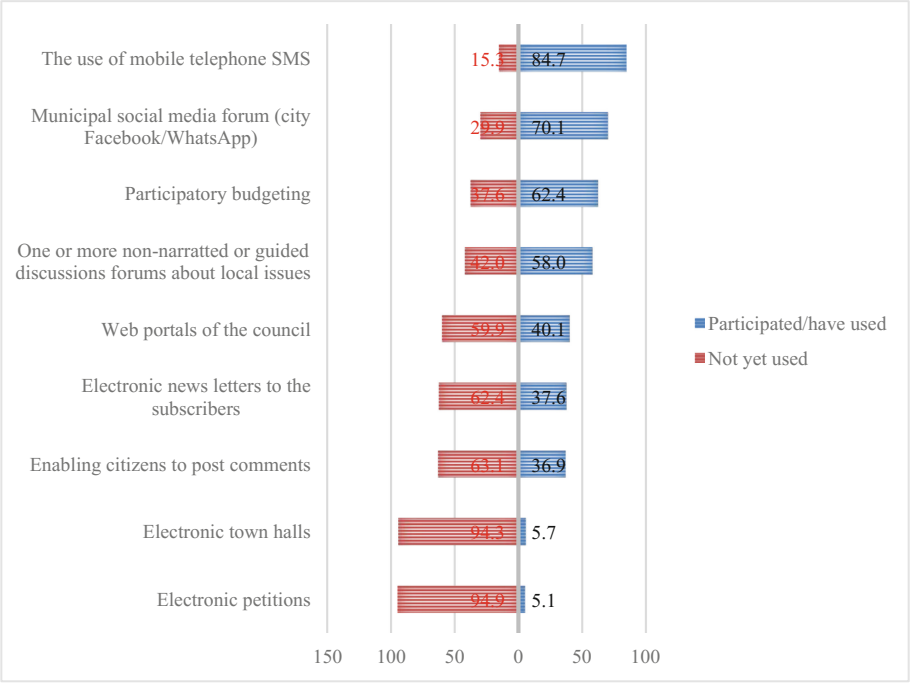

Fig. 3. Participatory online instruments used by councilors in the city. *Source: Own research 2017*

For the conduction of electronic town halls, respondents (3.2%) reveal that it is very bad, while about (32.5%) indicate that they are not important. On the other hand, the study findings (35.7%) and approximately (28%) of respondents reveal electronic town hall is important and very important respectively. In addition, a slightly small numbers of responses (3.8%) view that electronic petitions are very bad, and about (26.1%) reveal them as not important. On the other hand, the majority (43.9%) and (25.5%) of responses indicate that they are important and very important respectively.

Furthermore, study findings (1.3%) indicate that participatory budgeting is very bad, while about (5.1%) responses view it not important. While on the other hand, the responses (26.1%) reveal participatory budgeting is important, and majority responses of slightly above every six in ten (67.5%) find it very important.

Complaint chat rooms are very bad with (2.5%) of responses, and similarly, responses (17.2%) find it not important. While on other hand, about (38.2%) of responses reveal that it is important, and majority with slightly above every four in ten (40.8%) further indicate that the complaint chat rooms are very important. However, it is further worthy noting that the use of complaint chat rooms is currently not available or implemented. The responses (3.2%) indicate that one or non-narrated guided discussion is very bad, while still (10.8%) is not important. On the other hand, about (43.9%) of responses reveal that it is important, while majority (40.8%) view it as very important.

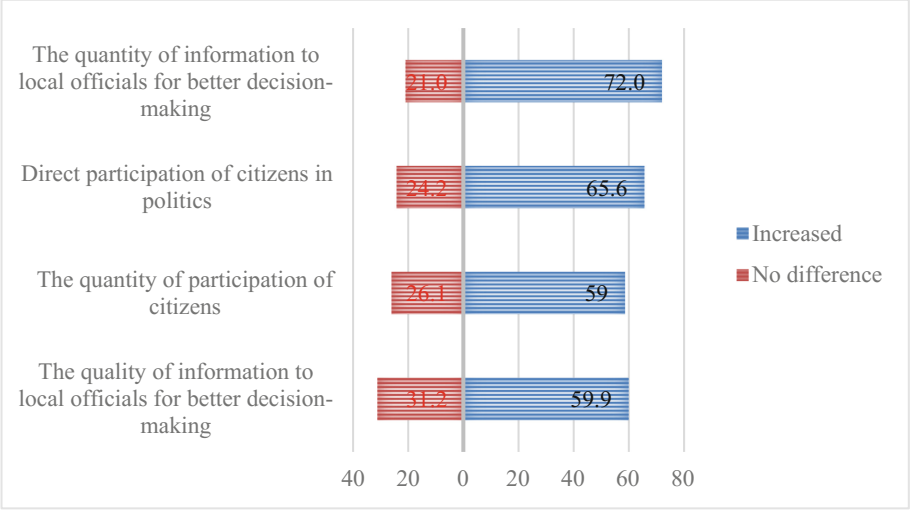

Fig. 4. The effects of online enabled participatory instruments on quality and quantity of citizen participation. *Source: Own research 2017*

To whether respondents have participated or which online instruments they have used to participate, the respondents (37.6%) reveal that they have participated in local politics using electronic newsletters. Electronic newsletters facilitate the sharing and

exchange of information to subscribers' emails between technocrats and local representatives. However, majority of the local representatives slightly above every six in ten (62.4%) have not yet used electronic newsletter to disseminate information, which implies that they have not yet subscribed to receive newsletters from either political or administrative wings of the authority. Electronic newsletters summarise quarterly and annual information, which is at times received by the local representatives on standing committees: the local public accounts committees, infrastructure and environment and public health committees etc.

In addition, responses (40.1%) shows that they have participated in politics or have used web-portals, while the highest number (59.9%) reveal that they have not yet participated using web portals to access information on operations of the council and participated in council politics. More still, the majority of respondents slightly above every seven in ten (70.1%) participated or used municipal/city Facebook or WhatsApp to participate and engage citizens, and only a smallest number (29.9%) have not yet participated or used municipal/city Face-book/WhatsApp in the engagement of electorates in social, political and economic decision making. This instrument especially Facebook is highly used because of availability of simple digital devices unlike others that necessitate high advanced gadgets.

More so, the use of mobile telephone (SMS) is high with (84%) of respondents, while a few respondents (15.3%) have not yet used mobile telephone (SMS) to participate in urban local governments. The highest use of mobile telephone (SMS) is highly attributed by the nature of the low speed of internet and user friendly of (SMS) on non-complicated high tech digital devices to reach a mass of local citizens. Furthermore, about (36.9%) of respondents: political and administrative wing have participated in enabling of citizens to post comments, while majority of slightly above every six in ten (63.1%) have not yet used the posting of comments to connect with electorates.

On the other hand, only (5.7%) of respondents use or participate in electronic town halls, while the highest number of respondents (94.3%) have not yet used or participated in urban local government. More still, about (5.1%) of the respondents participate or use electronic petitions to engage in council politics, while the highest numbers (94.9%) have not yet participated or used electronic petitions.

With regard to participatory budgeting, about above every six in ten (62.4%) of respondents participate and have used online budgeting. Here citizens contact representatives on their online platforms where they suggest their budget priorities to representative. While slightly above every three in ten respondents (37.6%) have not yet used it to participate.

In addition, majority of the respondents (91.1%) have not yet participated or used complaint chat rooms to engage in politics and connect with the citizens. The conduction of one or more none guided discussions are also gaining use, for instance, about (58.0%) of respondents participate using it, while (42%) have not yet used it.

The online enabled participatory instruments have had different effects on quality and quantity information and participation in the city authority. For instance, the majority of the respondents (72%) reveal that online participatory instruments increased quantity of information for better local decision-making, while, respondents (21%) indicate that there is a no difference. Furthermore, slightly above every five in

ten of respondents (59.9%) indicate that there is an increase of quality of information to experts in administration for better decision-making, while respondents (31.2%) refuted. In terms of quantity of participation, majority of respondents (58.6%) reveal that online participatory instruments increased the quantity of citizen participation in local politics, while a small number of respondents (26.1%) refuted the statement as well.

Lastly, with regard to the effects of online participation on direct participation, respondents (24.2%) indicate that online participatory instruments had no influence on direct citizen participation in politics, while the majority of respondents (65.6%) indicate that online participatory instruments increased the quantity of direct citizen participation in politics.

4 Conclusions

In fact, online participation seems to lead more to a blended democracy and not to a virtual political life in the internet. Blended democracy describes the interaction between online and offline participation and online and electronic democracy. Furthermore, E-democracy produces an *invented* space and a broad range of third space [13], which included protest against government and which lead to a higher responsiveness. In Uganda, for instance, local urban governments, a number of online instruments for political and administrative engagement are so far slowly emerging to connect political representatives, administrators and citizens in the administration and political decision making of the city in Kampala. The instruments in use include; Municipal social media forums or city face-book, electronic newsletter, electronic petitions, operation of electronic town halls, WhatsApp groups of local representatives, use of mobile telephone (SMS), online participatory budgeting, twitter, Instagram among others (e.g. see, Figs. 2 and 3 above).

However, the local electronic participation (instruments) are implemented by both the city authority (political and administrative wings) and while others are opened implemented by the individual local political representatives. For instance, the political representatives such as the lord mayors (political head-City hall) and lower urban mayors as well as local councilors manage their individual social media platforms for political engagement and connection of the electorates. Similarly, local political representatives use online platforms instituted by the urban government for internal online participation with local political leaders themselves in regard to political operation and decision-making. However, some of the online participatory instruments are not yet implemented, for instance, electronic town halls, operation of complaint chat rooms and electronic petitions. A development towards a regularly implemented electronic town hall meetings would enhance this instrument.

Nonetheless, online participation is seriously used by local political representatives to participate in politics of the council as well as engaging with the citizens. From the study results, it is in fact indicated that a number of social media forums are more used than others, for instance, political representatives use municipal/city Facebook, mobile telephone (SMS), web portals, and electronic newsletters among others. On the other hand, the technical administrations use also almost the same means for engagement of citizens in issues such as service delivery and provision enquiries, tax-bargain and

payment, information giving and complaint management. For example, the administrative wing uses social media, Twitter, Instagram, mobile telephone (SMS) and city WhatsApp groups for complaint management and service provision improvement in the city.

In general, it seems quite obvious that the new digital media are predominantly used in a kind of top down instrument to inform citizen about administration as well as the politicians. The new instruments for what kind of bilateral participation and real reflexes communication, are less developed. Here the focus more on information towards the administration and politicians about problems and complaints. This monitoring function of the online participation predominates. Next steps should include new forms of community planning and citizen source participation in the decision-making processes for new policies.

Appendix: Questionnaire

Dear respondent: I am from Münster University, Germany. I am carrying out academic research on **"Local Taxes and ICTs in Uganda: Good Governance by Participation and Transparency?"** I request for your inputs towards my research. Your views, opinions, comments and expressions are treated with utmost confidentiality. However, your participation is only for academic purposes and voluntary. You are at liberty to contribute, refuse or withdraw at any time.

(A) Online Participatory Instruments by the City Council.

What is important in local politics?							**What have you personally used or where did you participate?**	
	Very im-portant	**im-portant**	**Not im-portant**	**Very bad**	**D.K**		**Have used. Have participated**	**Not yet**
Conduction of one or more non-narrated or guided discussion forums about important local issues	❑	❑	❑	❑	❑		❑	❑
Facilitation or operation of complaint chat rooms	❑	❑	❑	❑	❑		❑	❑
Participatory budgeting (Conducted public consultations, e.g., engage public in the budget process)	❑	❑	❑	❑	❑		❑	❑
Permittance or facilitation of e-citizen petitions	❑	❑	❑	❑	❑		❑	❑
Conduction of electronic town halls	❑	❑	❑	❑	❑		❑	❑
Enabling citizens to post comments	❑	❑	❑	❑	❑		❑	❑
Mobile telephone SMS	❑	❑	❑	❑	❑		❑	❑
Municipal Social media forums (city's facebook)	❑	❑	❑	❑	❑		❑	❑
Web portals of the council	❑	❑	❑	❑	❑		❑	❑
e-Newsletters circulations to subscribers	❑	❑	❑	❑	❑		❑	❑

(B) ICT Enabled Quality of Participation

Thinking about the results of electronic participation, how has local government experienced the following benefits of electronic participation?				
	Increased	No difference	Decreased	Don't know
Quantity of information to local officials for better decision-making	❑	❑	❑	❑
Quality of information to local officials for better decision-making	❑	❑	❑	❑
Quantity of citizen participation	❑	❑	❑	❑
Direct citizen participation in politics	❑	❑	❑	❑
Other specify	❑	❑	❑	❑

(C) Socio-Demographic Information

What is your sex? a) Female ❑ b) Male ❑
What is your age category? a) 18-29 ❑ b) 30-41 ❑ c) 42-53 ❑ d) 54-65 e) 66+ ❑
What is your Marital Status? a) Married ❑ b) Not yet married ❑ c) Widowed ❑ d) Separated ❑ e) Divorced ❑
What is your highest level of education? a) No education ❑ b) Primary ❑ c) Secondary ❑ d) Tertiary ❑ e) University ❑
What is your Employment Status? a) Not employed ❑ b) Self-employed❑ c) public service ❑ d) Private sector employee ❑
What is your monthly income? _____ 7. What is your ethinicity?_____ What is your religion? a) Roman catholic ❑ b) Protestant❑ c) Pentacostal❑ d) Muslim e) Non ❑

(This is only part of the Sections of the Whole Instrument)

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Elite Capture and Co-optation in Participatory Budgeting in Mexico City

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Abstract. Participatory Budgeting opens up the allocation of public funds to the public with the intention of developing civic engagement and finding efficient uses for the budget. This openness means participatory budgeting processes are vulnerable to capture, where through subtle or unsubtle means authorities reassert control over the PB budget. With a focus on PB processes in Mexico City, this paper explores areas of vulnerability and approaches used to combat them. Digital approaches can be used to address issues during voting or in the monitoring phase, but these can raise the cost both of administering and of participating in the process, or may skew participation towards certain demographics.

Keywords: Participatory budgeting · Corruption · Participation

1 Introduction

Development advocates and institutions have, over the last 20–30 years, invested heavily in creating processes and structures to bring governance materially closer to citizens, and to increase participation as a method of reducing corruption and the monopoly over resources that distinct local elites hold. Participatory Budgeting (PB) has been considered one way of increasing trust in government and reducing institutionalised corruption through creating transparent, open processes that deliver citizen needs. It is perceived (and even described) by some as a "new golden bullet" [1, p 198] in the fight against corruption. However, as a mechanism of public participation it by necessity includes openings that might allow pre-existing institutionalised norms and values to be reasserted, and that may result in the recapture of resources by governments or third parties.

This paper focuses on this concept of elite capture through institutional responses to disruption using empirical evidence from the participatory budgeting program in Mexico City, which exhibits multiple different undermining behaviours relating the process s both in its digital and physical manifestations. It also discusses the broader implications of conducting PB digitally, examining the various digital democracy e-platforms used in instances of PB around the world, and the trade offs between accessibility and security of the ballot these platforms must make. This paper argues that PB is not in fact a golden bullet that miraculously rids communities of corruption, but a process vulnerable to re-institutionalisation and elite capture in both its digital and physical form.

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2 Background to Participatory Budgeting

Participatory Budgeting (PB) is an umbrella concept that covers a wide range of potential schemes.

Generally, it refers to the involvement of the public (through deliberative mechanisms or votes) in the setting of spending priorities or selection of individual public projects to implement. While its start in Brazil was tied to a specific moment and political project, Peck and Theodore [1] describe it as an example of "fast policy" - where it has rapidly spread around the world, adapting a broad concept to the service of a diverse range of actors. Notable is its adoption by the World Bank as a method of promoting good governance, which has been a key force in shaping how the intentions of PB are currently understood. Cabannes and Lipietz [2] separate current PB projects into "political" (an increase in deliberative democracy), "good governance" (better connection of civic sphere to government), and "technocratic" (optimised use of resources). Specific instances may move from one strand to another over time, with the example of the original instance in Porto Alegre shifting to more of a good governance model since 2005. While these categories have been discussed within the literature, PB implementing practitioners are less likely to conceptualise their programmes within this framework.

That participatory budgeting should function as a tool to disrupt institutionalised corruption was part of the initial conception of participatory budgeting in Brazil. As Gilman describes:

"In its original campaign for PB, the PT [Worker's Party] outlined four basic guiding principles: (1) direct citizen participation in government decision- making processes and oversight; (2) administrative and fiscal transparency as a deterrent for corruption; (3) improvements in urban infrastructure and services, especially in aiding the indigent; and (4) altering political culture so that citizens can serve as democratic agents." [3, p. 6]

While the evidence collected for this study suggests that the redistributive aspects of PB have been reduced in its international replication, the focus on corruption has sharpened. World Bank publications describe the problems of "the traditional budgeting process [that] can often contribute to social exclusion and poverty due to elite capture, lobbies, and powerful interests" and in another publication that "[t]he enhanced transparency and accountability that participatory budgeting creates can help reduce government inefficiency and curb clientelism, patronage, and corruption" [4, p. 5].

This belief is not without evidence, Zamboni [5] uses government audit reports of violations of public management regulations as a corruption measure in Brazilian counties and found better governance indicators in 7 out of 10 PB counties when they were paired with non-PB counties - however when the number of irregularities was scaled by the amount of money being audited, the picture was reversed, reflecting that the relationship is complicated. In addition Goldfrank [6] suggests that Brazil possesses a number of factors that make PB a particularly successful programme, that are not necessarily present in PB instances elsewhere Goldfrank [6, p. 66]. Sintomer, Herzberg and Allegretti [7, p. 30] argue that "[w]hen it is performed seriously, PB increases the

transparency of the use of public money as well as popular control, and therefore reduces corruption." However, the key part of that quote is "[w]hen it is performed seriously" - and there is an active literature [8–11] discussing the potential for corruption and co-option of the PB process.

3 Subverting PB - Institutions and Elite Capture

In understanding the wider picture of subversion of PB processes, there is an issue in that much relevant discussion in the literature uses several different terms and the influence of institutional behaviours and norms is underexamined. Most commonly, attempts to control a PB process will be described as "elite capture" - but the exact difference between this and "corruption" in often unclear. Hellman, Jones and Kaufmann [12] argue there is a split in the literature between discussion of corruption and capture, with two discussions occurring in parallel without identifying what makes these terms discrete. There have been attempts to identify areas where these tend to be used, and Dutta [13, p. 4] argues that problems of "corruption" tend to apply to central governments while "capture" by elites is described more as an issue of regional or local government, however this is by no means a definitive distinction, and reflects rather the correlation of the implementation of PB processes with devolution of power to local levels [14].

Even within the "capture" discussion, Lund and Saito-Jenson [10] argues elite capture is often "ambiguous" about the exact dynamics of the situation in question, and is "used interchangeably to describe elites' control of decision-making processes, their monopolisation and misappropriate of public benefits and malfeasance, and corruption by elites", drawing attention to the call of Beard and Dasgupta [15] and Fritzen [16] to distinguish between "elite control" and "elite capture" - where "elite control" refers to elites controlling decision-making arenas while "elite capture" occurs when elites capture the benefits of the PB process.

Discourse about elite capture is often unclear about the role of institutions. The assumption of elite capture is generally that the "elite" has interests that are served by attempting to capture a process, and the same terminology can apply both to elites who are and aren't officially embedded in existing decision making structures (a wealthy cultural group vs currently elected officials for instance). However this can conceal or minimise the role of embedded institutional interests and indeed the institutionalised societal structure as a whole. When new transparency and accountability initiatives are implemented, pre-existing and institutionalised power structures adapt in response to the disruptive element and move to mitigate potential losses and perpetuate those existing structures [17].

Goldfrank [8] argues that participatory budgeting is a form of competitive institution building, where PB processes are often set up in conscious opposition to existing institutional arrangements. As North [18] put it "the individuals and organisations with bargaining power as a result of the institutional framework have a crucial stake in perpetuating the system", and so decidedly *un*elite workers at a state organisation may act in a way to perpetuate the power of that organisation and undermine the PB process.

The agents of this process may in some cases be legitimately be described as elites, but there is a distinct character to the interaction of existing state organisations with PB processes that might operate against the existing interests of those organisations. As such, subversions of PB by state organisations aimed at perpetuating their current power requires a distinct terminology. The term "cooptation" is sometimes used in discussions of subversion of PB in Latin America. Holdo [9] takes the definition of "cooptation" from Selznick [19] - "the process of absorbing new elements into the leadership or policy-determining structure of an organisation as a means of averting threats to its stability or existence" (p. 3).

Keeley [11] describes two ways in which elites can undermine PB processes; either by simply ignoring priorities chosen by citizens, or by seeding the room with their supporters or structuring meetings to exclude other factions. These systems may experience change not just through changes of elite, but by escalation of subversion and anti-subversion by competing groups or organisations. Undermining methods of undermining is difficult, as the people and organisations who benefit may simply shift strategy. Sheely [20, p. 252] found that where an experiment to mobilise citizens to attend meetings in Kenya was successful, this led to a change in the meeting format to retain control - "if mobilisation is successful in increasing participation in planning meetings, it may also cause elites to modify the tactics they use to maintain influence over participatory institutions".

Institutional theory, with a focus on elite capture, is therefore a key framework with which to understand the phenomenon through which PB programmes, designed to disrupt the existing hegemony, are subverted.

4 Research Methods

This paper utilises a portion of a larger pool of evidence collected for a study into the current operation of PB internationally. Specific case studies were carried out in Mexico and Kenya involving a mix of semi-structured interviews, and collection of data and documentary (hard copy and digital) evidence. In addition, a technological review of several digital platforms operating internationally was conducted. Finally, semi-structured interviews were carried out with a wide range of stakeholders in the field of PB, including implementers, practitioners, academics, NGOs, local officials, philanthropic organisations funding PB, and international development professionals situated in key PB promoting development organisations.

To quantitatively explore the Mexico City PB process, results for each of the 1,183 different PB ballots ran in 2017 were scraped from the Electoral Institute of Mexico City (IEDF) website (http://sistemas2.iecm.mx/consulta2017/resultados/index.php). These were analysed to examine variation by delegation in engagement with online voting and the victory margin of the winning project. The current status of all projects selected to be implemented was also scraped from the IEDF monitoring website (https://portal.iedf.org.mx/seguimientoproyectos/presupuesto2017/index.php) to examine variations by delegation in engagement with the platform.

5 Findings

The discussion of the research findings are broken down into several sections. First, PB in Mexico City is examined, with a focus on the structure of PB programmes, the institutional pressure points exerted upon them, and potential points within the programme that elite capture can be experienced. This discussion also provides voting data taken from the PB programmes which demonstrates the distribution of votes and what they suggest about project competitiveness, including potential issues with the digital format. Second, a discussion of the specific digital aspects of PB programmes in general is provided, encompassing a number of international implementations and outlining the potential points of subversion, but also highlighting the technological aspects of digital PB that may reduce the potential for re-institutionalisation and elite capture of PB programmes. Third, a discussion of the weakness of PB monitoring is provided, citing examples of elite capture and re-institutionalisation of PB distribution activities.

5.1 PB in Mexico City

Early PB schemes were run in two parts of Mexico City (Cuahtemoc and Tlaplan) in the early 2000s, but PB in its current form in Mexico starts in 2010 with the passage of the Citizen Participation Law of the Federal District (LPCDF). This mandates a process that each of the 16 local authorities will run for neighbourhoods in their areas, with the voting administered independently by the Electoral Institute for Mexico City (IEDF). This was amended in 2012 to introduce a mandate for 3% of each local authority's budget to be spent on PB [21]. The funds are restricted to certain types of project, Wiemann and Fuchs [22] (who has previously written on the PB process in Mexico City) call this "pre-structuring", meaning that substantial decisions on what kind of projects in what area are effectively possible, are decided by the rules of process before any project proposals have even been invited. Pre-structuring in this context provides scope for institutional influence and potential elite capture in the very design of the process itself.

Overall, 3% of city budgets are committed to PB. In 2016 this was $874,920,194 pesos or around US$ 47 million [23]. However, because Mexico City is geographically large and contains a very dense population, the budgets represent quite a small amount of money per head. As the majority of the budget of these local authorities is used for salaries, 3% represents a large proportion of the remainder, and is therefore a substantial imposition on the actual services budget. This creates an incentive for local authorities as institutions to attempt to capture the process of project allocation.

5.2 Selecting Projects

In Mexico City, proposals are submitted in writing on a standardised form, and expert councils comprised of academics and other technical experts are assembled by each local authority to determine which projects can proceed to a vote. Ideally, this gives citizens a stake in projects proposed and leverages local knowledge to suggest better fitting solutions to local issues.

However, this first step of the process is vulnerable to subversion, as while a project may be proposed by a citizen, this is not necessarily where the idea originated. Rather than being citizen sourced, many projects are "citizen-washed", that is, projects are proposed by the local authority itself, using a citizen as an intermediary. This undercuts any benefit of local knowledge in the citizen sourcing of proposals and provides citizens with a choice of projects that are likely to have been implemented by the authority without the PB process. In cases such as this, the local authority can remain in effective control of its budget if the choice of projects is controlled.

Another concern raised in Mexico City was that the written formalised process might disadvantage or deter project ideas proposed by illiterate or less literate citizens. Similarly, in Solo (Indonesia) Grillos found that the poorest subunits were less likely to submit proposals overall [24].

5.3 Voting

For electronic voting in Mexico City, fluctuating numbers of voters over time reflect changes in the security of the ballot. As an EMPATIA Project presentation noted "The chance to directly influence public expenditures can generate deceitful or abusive behaviors in PB. ICT vulnerabilities increase this risk, which is limited in face-to-face interactions." [25]. In Mexico City, all that was required to vote online was information on the voting card. Interviewees mentioned incidents where authorities or third parties asked for information from residents to register them, but then discovered when they came to vote that their vote had already been cast. There was a substantial problem with online fraudulent votes in 2015, leading to security additions in future rounds reducing the number of online votes from around 100,000 to 5,000. This mirrors the similar transition in the PB program of Bela Horizonte. In 2008, the online PB included 124,000 participants (three times more than the offline component), however complaints of fraud led to increased security standards and by 2011 only 44,000 people participated online [26].

In the 2017 Participatory Budgeting exercise there were 279,023 valid votes cast offline and 4,554 online over 1,183 neighbourhood votes. Only 15 projects had the winner changed as a result of the online vote. There is substantial variation in the number of votes cast in each delegation (due uneven population size as well as uneven turnout). Online voting was unevenly distributed, Iztapalapa accounted for 18.6% of the total offline vote, but 43.4% of the online vote (see Table 1).

Issues of ballot security were not limited to online voting. Interviewees mentioned problems of vote buying, where hundreds of street vendors might be registered in a single building by organised crime groups for the purposes of generating voting cards in an area. This is interesting, as while this can be considered "elite capture" of PB, and subject to influence by institutionally powerful actors, the organised criminal element here presents an additional layer of opaqueness and corruption previously unconsidered. A potential concern for elections with large numbers of projects on the ballot is that votes may be too widely distributed and result in winners with low popularity. However, this is in most cases not the case in Mexico City. Despite there being an average of 8.8 options on the ballot, the winning option tended to receive majority support and the average percentage of the total vote was 63.2%.

Table 1. Valid votes by delegation

Delegation	Offline votes	Online votes	Ratio
ÁLVARO OBREGÓN	31,493	174	0.55%
AZCAPOTZALCO	8,554	92	1.08%
BENITO JUÁREZ	3,616	67	1.85%
COYOACÁN	33,018	175	0.53%
CUAJIMALPA DE MORELOS	7,547	63	0.83%
CUAUHTÉMOC	6,096	123	2.02%
GUSTAVO A. MADERO	40,945	559	1.37%
IZTACALCO	32,345	216	0.67%
IZTAPALAPA	51,880	1,987	3.83%
MAGDALENA CONTRERAS	4,697	69	1.47%
MIGUEL HIDALGO	7,186	89	1.24%
MILPA ALTA	2,399	33	1.38%
TLÁHUAC	4,499	102	2.27%
TLALPAN	14,694	167	1.14%
VENUSTIANO CARRANZA	23,556	530	2.25%
XOCHIMILCO	6,498	108	1.66%
Grand total	279,023	4,554	1.63%

To make comparisons between ballots with different numbers of options, the winning percentage can be expressed as a ratio to the percentage if all votes were distributed evenly. For example, in a four option ballot the even distribution would be 25% - so a winner with 75% would have a ratio of 3. Higher numbers reflect a wider discrepancy between reality and the "even" result.

Table 2 shows there is a large gap between first and second place, with an average ratio of 4.74 for first place and 1.39 for second place. This varies between delegations, with Iztaclco having a ratio of 8.80 and Benito Juárez a ratio of 2.82. To express this as a percentage of total votes - the average distance between first and second place was 45% of the total vote.

This reflects that in most local PB ballots, there was no serious competition, one project accounted for a large percentage of the vote and won by a significant margin. This may reflect genuine local support, but might also be indicative of areas where there is a strong official project and/or vote buying, and where institutional norms facilitate elite capture of programmes.

5.4 Implementation and Monitoring

Once a project is selected through a vote, there remains the process of converting it from idea into reality. Without sufficient post-award monitoring, there is scope for funds to go missing or for the project to fail to materialise altogether. Plata argues that one of the deficits of the Mexico City system is "the lack of clarity about the institutional mechanisms for citizens to participate in the implementation and evaluation" of

Table 2. Vote ratios by delegation

Delegation	1st Place ratio	2nd Place ratio	3rd Place ratio
IZTACALCO	8.80	1.35	0.37
VENUSTIANO CARRANZA	6.67	0.64	0.33
IZTAPALAPA	6.20	1.91	0.72
MIGUEL HIDALGO	5.86	1.97	1.06
GUSTAVO A. MADERO	5.04	1.38	0.61
MILPA ALTA	4.98	1.94	1.04
CUAUHTÉMOC	4.38	1.53	0.79
TLALPAN	4.36	1.70	0.86
XOCHIMILCO	3.98	1.54	0.78
ÁLVARO OBREGÓN	3.97	1.03	0.45
COYOACÁN	3.70	0.95	0.44
AZCAPOTZALCO	3.64	1.21	0.48
CUAJIMALPA DE MORELOS	3.47	1.10	0.33
MAGDALENA CONTRERAS	3.32	1.21	0.49
TLÁHUAC	2.89	0.91	0.37
BENITO JUÁREZ	2.82	1.37	0.81
Grand total	4.74	1.39	0.62

the projects.[23, p. 66, translated] After the vote, there is no formal role for the submitters of the project. It is essentially in the hands of local authorities to arrange contracts and complete.

In these conditions, the choice of contractor can serve as a conduit for patronage. A citizen group interviewed complained about an incorrect (and cheaper) construction technique being used in a successful sidewalk repair project a few years earlier. In the context of amorphous projects like road repair, there is significant room for money to go missing through selection of cheaper materials.

In these instances corruption would result in an inferior final project - but it is still completed. In other cases, the local authority has reported that the project is complete when in fact it wasn't even started. A commonly overlooked issue in Participatory Budgeting is a formal way of tracking progress of the projects. In Mexico City the IEDF have built a website that encourages social media reporting of project statuses so that there is some room for popular monitoring of the construction process.

While this website is an interesting approach, it suffers from low engagement that is typical of this kind of platform (see Bailard et al. [27]). Table 2 shows that 67% of projects are still marked as unstarted. While 25% are marked as completed, these are mostly concentrated inside a few delegations, 9/16 delegations have no engagement on any project (Table 3).

The utility of this tool in Mexico City is limited by the fact that IEDF has no legal powers of enforcement, but it has partnered with other offices of the government of Mexico City to attempt to hold corrupt officials to account. Where budgets or projects were changed (for instance if a local authority says they have constructed a computer

Table 3. Project progress (as reported) by delegation

Delegation	Not started	Initiated	Finished
ÁLVARO OBREGÓN	28	22	199
AZCAPOTZALCO	111		
BENITO JUÁREZ	64		
COYOACÁN	155		
CUAJIMALPA E MORELOS	24	14	5
CUAUHTÉMOC	64		
GUSTAVO A. MADERO	232		
IZTACALCO	4	39	12
IZTAPALAPA	293		
MAGDALENA CONTRERAS	52		
MIGUEL HIDALGO	88		
MILPA ALTA	1	11	
TLÁHUAC	58		
TLALPAN	2	9	167
VENUSTIANO CARRANZA	43	7	30
XOCHIMILCO	2	41	37
Grand total	1221	143	450

center in a school, but it was never built), files are passed over to other offices and around 40-50 people in the local authorities have been sanctioned or removed from office as a result of this process. While her research pre-dates this approach and so doesn't pass judgement directly on its success, Sánchez recommends the law related to participatory budgeting in Mexico City be amended to add explicit penalties on officials for corruption or non-compliance in the process [21].

Kossow and Dykes [28, p. 28] argue that truly effective anti-corruption ICTs "need a functioning accountability framework that includes an independent judicial system, press freedom and an active civil society". In Mexico City, while there is some framework of accountability, this is ad-hoc and depends on the organisations involved taking a wide view of their remit. While the monitoring platform is generally under-used, it is not clear that a more trafficked platform would lead to greater accountability or delivery. It is the tool that can be implemented by the current organisational actors, but not necessarily sufficient to achieve the goal of ensuring delivery of high quality projects.

Olken [29] argues crowd-sourced approaches to PB monitoring have problems with elite capture (where the monitoring is undermined by the elite benefiting from the process) and free-riders (where people who might hypothetically benefit from monitoring do not participate, hoping to benefit from other people's work, to the detriment of the overall monitoring). In a field experiment, he found that expert audits of road surfaces decreased discrepancies between official and estimated costs of road projects. Grassroots monitoring groups were ineffective at this, but effective at detecting discrepancies in Labour.

6 Conclusions

This paper has examined the risks of cooptation and elite capture in the PB process in Mexico City. The attitudes and incentives of key organisational players such as the local authorities, the electoral institute and civil society groups illuminate the current conflicts (or lack of conflicts) over the operation of the PB system and demonstrate the institutional influences that facilitate them.

At the proposal stage, weak citizen engagement with PB leaves the local authorities as the major actor capable of creating high quality projects. While individual projects from citizen groups can succeed, projects "citizen-washed" by councils are at a distinct advantage over other projects. That there is a clear winner in the majority of project selections despite the range of projects on offer reflects a lack of competition at the local level. For the voting stage, the IEDF as an external organisation exists in conflict with groups attempt to affect the outcome. The IEDF is able to adjust the voting process over time to address risk of subversion, this is however at the expense of a wider base of participation and cannot address the problem if effective choice has already been constrained at the proposal stage.

The IEDF's monitoring website deserves consideration as an example of how "crowd-sourcing" monitoring sites can supplement the current pre-vote focus of electronic PB implementations. However, the wider literature on anti-corruption platforms suggest limits to this approach - while citizens may be in a position to recognise if a project was delivered, they are far less able to detect mis-allocation of resources in construction (via materials or employment). For monitoring websites to be successful they must be embedded in a system that can make use of complaints. In the absence of strong sanctions for non-delivery, even a well-used website may not accomplish its goal of ensuring projects are delivered.

This paper has demonstrated how pre-existing institutional frameworks have enabled the elite capture of PB programmes in Mexico, and should be considered a first step in better critiquing and testing how such programmes may be made "tamper-proof" to institutional pressures.

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Digital Collaboration and Social Media

Exploring Public Sector's Roles in Collaborative Consumption – A Research Agenda

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Abstract. Motivated by the growing significance of sharing economy within our society, we here discuss which role the public sector may have within collaborative consumption (CC). CC refers to a business model grounded on peer-to-peer based sharing of goods and services through community-based online services. While public sector to a large extent has transformed from formalised bureaucratic structures into more hybrid organisations, focusing on the co-creation between public and private stakeholders, public sector's role within the sharing economy is still in need for further investigation. We reflect on the need for studying how public sector could benefit from a more active role within CC for public service provision in the e-government area. Based on current literature on CC, we argue that the public sector can take on three main roles in CC: the customers, the service providers, and the platform providers. We further develop suggestions for a research agenda in this area and raise questions for a further discussion on the role of public sector within CC.

Keywords: Collaborative consumption · Public services · Public sector Government · Research agenda

1 Introduction

The way public sector provides services changed during the past 30 years, from rigid and bureaucratic structures [1], into decentralised forms of co-ordination, leveraging on the concept of competition rather than control, and favouring markets more than hierarchies for ensuring efficient allocations of scarce public resources [2]. Confronted by progressive reductions of budgets and increased pressure on the efficiency of public expenditures, new hybrid forms of public-private collaborations emerge [3], allowing for co-production of services including both public bodies and citizens [4]. In the current global climate of austerity and in the aftermath of the recent world financial

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crisis [5–7], the importance of co-operation between the public, private, and the citizens for service deliveries will most probably increase [8]. Meanwhile, new forms of goods and service consumption emerge [9], based on the principles of sharing individual resources, temporary ownership, and access to digital platforms. These new business models, often referred to by the umbrella concept of sharing economy, leverage on forms of co-operation among different actors – including the customer – through digital platforms [10]. Sharing economy applications evolve on separate trajectories from that of public services [11]. However, they are increasingly creating tensions with services regulated by the public sector, exemplified by the prominent conflict between the Uber company and the public taxi transportation service in cities all around the world, or Airbnb influencing the traditional hotel industry. Thus, in CC the public sector currently takes a role that is mainly limited to regulatory aspects.

In this paper we explore the roles public sector may play within these new business models, beyond their traditional regulatory role [12, 13]. We introduce the concept of collaborative consumption (CC), a specific business model within the sharing economy [14], as a framework for studying the role of the public sector within the sharing economy. While several sharing examples are based on the co-ownership of resources between two or more individuals, CC focuses on triadic relationships between customers, peer service providers, and platform providers [14]. Hence, we argue for CC to be a suitable framework for studying the partnering models where public sector, citizens, and private companies act together in various constellations for creating innovative ways of delivering public services and consuming goods and services.

Our aim is to initiate a discussion within the e-government community on the roles of public sector in the sharing economy, and to present a systematisation of avenues for research within the field. To address this, we follow [15]'s hermeneutic approach for reviewing the literature on CC and public sector. We argue how public sector can assume the three roles in CC – customer, service provider, and platform provider – discuss implications, and identify research gaps, which we summarise in a research agenda.

2 Method: Conceptual Framework and Hermeneutic Cycle

Our review is based on a hermeneutic literature review process [15], which is a common approach especially in conceptual papers in the field of Information Systems and e-government (cf. e.g. [16]). In contrast to structured literature reviews, this approach acknowledges literature reviews as subjective and interpretative processes in which the researcher gains a deeper understanding of a subject over time by iteratively identifying relevant literature, thus digging deeper into the body of knowledge. The hermeneutic approach consists of two intertwined circles, the search and acquisition and the analysis and interpretation circle (cf. Fig. 1).

Searching for literature on the concept of CC in the public sector, we found that research in this field is scarce with most articles ascribing a passive, regulative role to governments (see Sect. 3.2). Thus, we identified the need of deriving a research agenda for CC in the public sector in order to advance this field in a structured way. Therefore, we searched for literature on CC in general and finally decided for [14] 's framework as

the basis for our analysis since they provide a clear distinction of the different actors in CC, consisting of a triadic relationship between a customer, a service provider, and a platform provider. We iteratively searched for relevant literature for discussing these three roles within the public sector. Based on our identified research gaps, we derived a research agenda for thoroughly analysing public sector's role in CC.

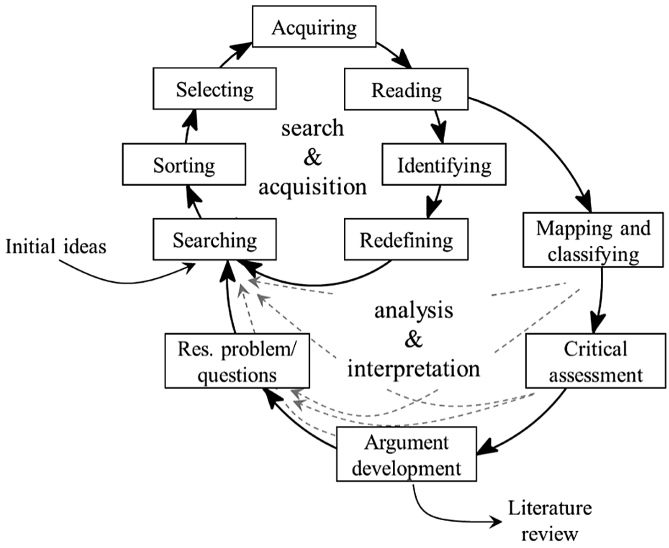

Fig. 1. Hermeneutic framework for literature reviews by [15]

3 Related Work

3.1 Public Sector Responsibilities

In order to discuss the role of the public sector in CC, we need to understand the main responsibilities of public sector within the society. Interestingly, this is rarely discussed within the e-government field; the reason why public sector exists is more or less taken for granted. Anderson [17] introduces seven main areas governments have within societies. While a thorough discussion of these is beyond the scope of this paper, we introduce them here to inform the discourse of CC within public sector, by reflecting on how public sector roles within the sharing economy could influence on the main responsibilities public sector has within the societies (in section four below).

The government *provides an economic infrastructure, with institutions, rules and arrangements needed within a society* [18]. This includes the definition and protection of property rights, enforcements of contracts, tariff systems and currencies. Rules for the economic infrastructure are provided by the political systems, explicated by regulations, and protected by sanctions. The government also provides *various goods and services* valuable, accessible, and broadly used by everyone, while being difficult to

pay for by their individual use. Such goods include the national defense, roads, crisis response management, and other public infrastructures, representing the public goods within societies. Furthermore, the government is responsible for *the resolution and adjustment of conflicts, to pursue justice, order and stability,* including the protection of weaker groups, the provision of laws and sanctions to avoid exploitation of children, and regulations to secure a minimum wage for workers.

Competition within the society needs to be maintained to avoid cartels, price-fixing, and companies restricting access to their products for groups of citizens, by providing rules and regulations to avoid one or few actors to dominate the market, to maintain a healthy competition to secure the best possible quality at the right cost for the benefit of the society and their members. Moreover, the government also acts in the *protection of natural resources* for defending the nature against degradations, to maintain the interests of future generations. Governments are also *responsible for securing all members of the society a minimum access to goods and services of the economy,* for instance by adjusting potentially socially unacceptable consequences of the market economy on members of the society, such as poverty and malnutrition. People may be excluded from access to the market economy due to illness, old age and illiteracy, in which case governments are expected to *intervene to provide a minimum level of assistance*. Finally, since there will always be fluctuations within the economy with booms being followed by regressions, an important role for government is to *stabilize the economy*, through budgets, monetary policy, and control over prices and the state finances [18].

3.2 Collaborative Consumption

CC are "peer-to-peer based activities of obtaining, giving, or sharing access to goods and services, coordinated through community-based online services" [11]. CC underpins a form of coordination among the consumption behaviour of individuals who agree on their consumption actions, or on the acquisition and distribution of resources for a compensation [9]. CC applications are favoured by the diffusion of digital platforms – like social media – and digital eco-systems [19, 20], which facilitate communication and coordination among different actors cooperating for a common goal [21, 22].

CC holds a potential venue to stimulate sustainable consumption practices [23], to promote a cultural shift from ownership to access and sharing of resources [24]. The behaviour of individuals in a CC context is guided by information sharing, collective coordination and decision making, and individual and communal rational behaviour. On the one side, the used digital platforms reduce the transaction costs for creating connections among unacquainted members and for sharing information among them [11, 25, 26]. While on the other side, people act in these settings on the basis of rational reasoning, seeking the maximisation of utility and the minimisation of costs [27].

The exchange of goods and services among members of the community can be based on direct or indirect reciprocity. In the former case, there is often a high level of uncertainty since participants rely on the norm of reciprocity (comparable benefits) instead of explicit agreements (negotiation). In the latter, participants provide valued resources to others without any expectation directly from the same person [28].

In social exchange terminology, this is called 'generalised exchange' where people give benefits in response to needs or to demonstrate a general concern for the other person [29]. These settings are prone to free riding and opportunistic behaviour, and may determine failures where CC instead of being a way of sustainably coordinating resources usage, leads to the tragedy of the overexploitation of the commons [30].

Three main characteristics delineate CC from traditional forms of exchange [14]: the number and type of actors, the nature of the exchange, and the directness of the exchange (cf. Table 1). First, CC represents *a triadic connection*, including (a) a platform provider enabling the exchange, (b) customers who request access to the assets, and (c) a peer service provider who grants such access, resulting in two different providers serving the customer. Second, in CC, there is no transfer of ownership, rather, the peer service provider grants *temporary property rights* to customers. Third, CC is mediated through *market mechanisms*, unlike related phenomena such as sharing, which relies more on social mechanisms. Consequently, CC include actors who have economic motives (among others) for participating in the triadic connections with others.

Table 1. Main characteristics of CC (adopted and extracted from [14]).

	Collaborative consumption
Number and type of actors	Triadic, between a platform provider, a peer service provider and a customer
Nature of exchange	No ownership transfer, shorter periods of agreed consumption time of underutilized assets from the peer service provider, sequential use
Directness of exchange	Mediated through market mechanisms

3.3 Existing Studies of CC in the Public Sector

Academic literature on collaborative consumption mostly refers to the public sector taking a regulative role in private sector initiatives [31, 32]. Articles that discuss the application or implications of CC in public sector organisations are few.

From an empirical perspective, CC is mainly discussed in the context of smart cities with the aim of providing better transportation and housing infrastructures. Experts call for municipality-driven alternatives to private-sector business models such as Uber and Airbnb [33]. In 2012, for example, the Seoul Metropolitan Government started the Sharing City Initiative for facilitating access to services such as transportation and public libraries. Evaluations in this context show that CC does not necessarily have to be a purely private sector related business model but can be driven by governments as well, thus pursuing societal and economic goals [34]. Such initiatives can create more transparency and accountability when governments provide open data about their activities.

The literature discusses various challenges for the public sector when engaging in CC. Governments need to adjust the legal framework, removing potential obstacles to CC activities [34, 35] and need to cooperate with external stakeholder including private

companies, NGOs, citizens, and other public sector organisations [34]. Relying on third parties requires governments to give up their monopoly of the provision of services and makes them more dependent on the behaviour of actors that are out of their control. Thus, adopting CC in the public sector requires a cultural shift for governments as they need to deal with the idea of decreasing ownership [33], which might lead to a changing role of the public sector as perceived by the public [35]. Furthermore, especially in the context of smart cities, governments would need to access raw data from various sources as citizen platforms, Internet of Things, sensors and open city level data, which they are currently lacking [33] and would have to provide initial funding for promoting CC projects [34].

In addition to the rather passive regulative part in CC, the discourse on the more active roles that governments can play is limited within the current body of knowledge. While [35], for instance, review several e-government models according to their suitability for CC purposes, they narrow their perspective on governments serving as the platform provider in CC. However, "*[g]overnment and regulators do more than set policy. They can also be active participants in the collaborative economy by supporting, encouraging or promoting collaborative economic activities that enable more efficient provision of public services. […] How can governments at all levels get the most benefit from the collaborative economy?*" [36]. We believe that in order for public sector to benefit the most from CC, it is worthwhile to discuss if and how they can take on the three roles as discussed above: customer, service provider, and platform provider. However, such a perspective is currently under-researched by the literature.

4 Public Sector's Roles in CC

4.1 Public Sector as a Customer

By taking the customer role, public sector organisations can use goods and services that are provided by other parties, e.g. by other public sector organisations, citizens, or companies. This might be a cost-efficient alternative to owning resources that are (a) needed only occasionally or (b) very urgently and that cannot be provided by public sector organisations themselves. An example for public sector organisations acting as customers is the online platform MuniRent (https://www.munirent.co/) where organisations can use idle equipment such as heavy machinery provided by other parties. In doing so, public sector organisations do not need to own specialised equipment which they seldom use. For a monthly fee, MuniRent offers public sector organisations to list, reserve, and loan their surplus equipment. Another example of public sector acting as customers in CC is renting resources in urgent cases from public and private sector organisations. In emergency situations such as floods, hurricanes, or wars, the public sector needs housing for many people which they may not provide themselves. Thus, they can use online platforms to rent idle housing spaces from citizens and organisations (such as flats or sport halls). During the hurricane Sandy, governments cooperated with private actors like Airbnb, to find housing for the homeless people [37].

Acting as a customer in such a CC environment inevitably means involving other stakeholders such as citizens and organisations in the process of public service delivery

by using the goods and services they provide. The customer role may change the self-understanding and role of governments in relation to the public. Furthermore, this raises the question if CC could lead to the long-desired idea of co-creation and participation. Both research and practice have long since discussed the theoretical potentials of including citizens in public sector service delivery and creation. However, up to now, success stories about participation are rather few [38]. From an economic point of view, being the customer in CC hypothetically promises costs savings since governments do not need to own all resources they use. However, it could also be prone to negative externalities against the intended governmental aims of stabilising economy and giving equal access right if for instance we think of the tensions that cases in the private sector like Foodora are creating in the labour market in some countries. Anyhow, this comes with a change in governments' business models, which currently rely on long-term contracts with certain providers and call for tenders. It is unclear how the quality of public services changes through CC [36]. A key challenge is to ensure the quality of the consumed goods and services if their creation is out of control for governments. Governments need to rely on the availability of critical resources (e.g. in crisis situations). As such the public sector role as a customer might lead to a conflict with certain government responsibilities such as *the resolution and adjustment of conflicts, to pursue justice, order and stability.*

4.2 Public Sector as Peer Service Provider

Public sector organisations can share idle resources with other public-sector organisations, citizens and companies via online community platforms. Public sector organisations possess equipment which is seldom in use, such as dump trucks, excavators and guardrail cleaners, and can thus be offered to others while another example refers to online libraries which lends books to citizens. Local governments provide the resources (books), which in most cases are managed via an electronic catalogue. Citizens can borrow these resources either offline or online and typically pay a monthly or yearly fee. Governments can even serve as the platform provider if they are the ones running the electronic library catalogue. A further case of the public sector acting as the peer service provider is the sharing of publicly owned cares via car sharing apps. The city of Offenbach, for example, shares government-owned vehicles on weekends with citizens when they are not needed otherwise [33].

The service provider role may influence citizens' trust in governments if the public sector participates more actively in people's life by sharing goods and services with them. In the best case, this might lead to more transparency on government actions, thus creating more credibility. Sharing goods and services can help governments to ensure their *responsible for securing all members of the society a minimum access to goods and services of the economy*, which can, for example, be achieved by sharing resources especially with people in need. As governments would act as a new competitor in the market by sharing goods and services, this will have an effect on their responsibility of *stabilizing the economy.* For the public sector as such, the service provider role may, one the one hand, lead to financial income, while, on the other, also enhancing and creating new tasks concerning for instance questions of liability. At the same time, considering inequality in the access to digital technologies, this could also

reduce the societal and economic cohesion within a country, and create potential competitive tensions with the private sector.

4.3 Public Sector as Platform Provider

Public sector organisations can offer online platforms where other stakeholders such as citizens, non-government organisations, and companies can share (public service related) resources [35]. This can include all kinds of goods and services, like the sharing of resources in crisis situations, ride sharing in order to reduce transport, or offering fellow citizens support in coping with government services. However, this could theoretically go as far as governments outsourcing government services to service providers. Moreover, the public sector could also offer an online-based community for internal resource sharing where to allocate personnel and equipment when needed.

It needs to be identified if it is economically sensible for the public sector to act as the platform provider since this could increase the workload for governments. From a consumer point of view, public sector serving as intermediaries between the customer and the service provider might increase the trust in the goods and services shared via the CC platform, and could avoid the tensions that private managed platforms are creating on the market. This aspect touches upon governments' responsibility of *providing an economic infrastructure* for its citizens. Again, this changing role of the public sector in society would possibly influence the trust in government.

5 Research Agenda

We argued that CC can challenge the current organisation of the public sector and deserves more attention from the research community. Based on discussing the different roles that governments can take in CC, we would like to draw the attention now to several arising questions that should be addressed by research in the near future.

5.1 Tasks and Services in the Public Sector that Are Suitable for CC

The public sector fulfils an abundance of different tasks and, as explained above, has to cover various areas of responsibilities. It seems obvious that not all of them are suitable to be delivered or consumed via CC. Future research should therefore identify assess the feasibility of CC projects within different parts of the public sector:

- How does CC relate to the different areas of responsibilities within public sector?
- What kind of public sector responsibilities could benefit from including CC business models, and what responsibilities should better not be exposed to such logics?
- Which public sector services are suitable for being offered or consumed via CC?

5.2 Implications of CC in the Public Sector

Taking part in CC activities challenges public sector's traditional way of working. Public sector could, for example, become more strongly dependent on the provision of goods and services by other parties. While potentially reducing their own effort, CC

activities create new tasks for the public sector, which need to be managed. This raises a number of issues to be clarified:

- What are societal and legal implications of CC in the public sector?
- Which economic and societal negative externalities are raised by a CC strategy for the public sector?
- Which new competences are needed to manage this change in the public sector?
- How does the business model of the public sector (has to) change?

5.3 CC-Driven Change in Relationship Between the Public Sector and the Public

When engaging in CC activities, the role of the public sector within society changes since citizens and private sector organisations become more strongly involved in the provision of services. This could lead to the desired paradigm shift that was proclaimed in the e-participation context. At the same time new forms of self-organization might reduce the need for traditional political and democratic institutions through which public services and public services policies are traditionally organized. In order to predict the changing relationship, future research should analyse:

- How does the (self-) understanding of public sector change by taking on roles in CC?
- How does the public sector – citizens relationship, and the perceived trust, change?
- Could CC be a way for increasing the level of participation or engagement in the public discourse by the citizens?
- How does CC initiatives affect economic viability and social vitality, as well as political validity and viability?

5.4 Theories for Analysing CC in the Public Sector

As already argued, CC in general and especially in the public sector is undertheorized. It becomes obvious that transferring this business model to the public sector touches upon various disciplines such as public administration, politics, law, economics, organisation management, e-government, and information systems, to name a few. In order to provide a comprehensive theoretical picture, we need to answer:

- Which disciplines, apart from e-government, should be considered when conducting research on CC in the public sector?
- Which theories do we need to incorporate in future research?

5.5 Methodological Considerations

Given the emphasis on understanding the phenomena investigated within their real-life context through a rich description of particular instances [39], it is appropriate to adopt an explorative case study approach [40]. Exploratory case studies typically address how and why questions [39] concerning the dynamics present within a particular

contextual setting [41], with the objective of developing initial understandings, which is clearly needed within a new research area of interests.

However, since real-life examples of CC in the public sector are few, which makes it difficult to run case studies or quantitative studies, we believe simulation to be a viable method for investigating the research issue. Simulation studies are considered particularly useful for building a place in which it is easy to explore new concepts, ideas, boundaries and limitations [42]. For this reason, we plan to investigate our proposal of studying public service provision in a CC scenario through simulation studies, which are methods for using computer software to model the operation of real world processes, systems, or events. For their nature, simulations work as virtual experiments [43]. Based on insights from both empirical studies and simulation experiments we will perform in the next steps of the research project, we believe that there will be the need to strengthen the theoretical underpinning of CC in the public sector. Thus, we also argue for the need of further conceptual studies in this area.

6 Conclusive Remarks

In this paper we have argued that in addition to acting as a regulative body in CC, governments can take the three different roles of customer, service provider and platform provider. We discussed the implications that might go along with the new roles for the public sector and subsequently derived a research agenda to serve as a roadmap for future research on CC in the e-government field. Thus, we contribute to the current body of knowledge by providing a systemised overview of research gaps that need to be addressed. As for the practice we are initiating a discussion on CC in the public sector that moves beyond the yet prevailing notion of governments being an outsider in the triadic relationship that constitutes CC. We argue that it is worthwhile for the public sector to take new and thus more active roles in CC. Finally, regarding the relationships between the public sector and citizens, since CC is built on community-based activities, it is interesting to explore the issues concerning economic viability (sustainability) and social vitality (reciprocal relations for satisfying social needs), as well as political validity and viability (power mobilization and distribution in making decisions).

Our research is naturally limited in various ways. Being among the first ones to systematically address the possible roles of the public sector in CC we struggled with identifying relevant theoretical literature. In addition, actual applications of CC in the public sector are scarce, thus limiting the empirical evidence. We do not claim completeness for our research agenda and suggest integrating further literature from disciplines related to CC or the public sector such as public administration or political sciences. What is more, we have left out the role of governments as regulatory entities in the CC process, which might also raise points for future research. Nevertheless, we believe that our work provides a helpful point of departure for discussing CC in the public sector.

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Policy Modeling and Policy Informatics

Time to Legislate

A Database to Analyse the Temporal Dynamics of the German Legislature

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Abstract. What are the temporal features of the German legislature? How quickly do lawmakers act and how fast is the acceleration of policy-making processes? To this day political science has not succeeded in analysing these time-related questions concerning the legislature and the time-strategic actions of political actors comprehensively and quantitatively. So far a vast, ample database comprising said information does not exist. Such a lack seems surprising as time as a resource in policy-making is extraordinarily relevant and the collection of necessary information on the German legislature is at least technologically possible today.

This paper therefore puts its scientific focus on above-mentioned methodological challenges. It points out how important temporality is to the research on decision-making processes and it presents a database which will list every single procedural step within any given legislative process. The foundation for all raw data is formed by the entire body of indexes of legislative material, issued and published by the Parliamentary Archives of the German Bundestag for every law respectively. All requested pieces of information are obtained by the means of a computer-assisted read-out. Thereby and for the first time, research on the temporal dimensions of policy-making – its duration, pace and acceleration – will become adequately accessible to analysis.

Keywords: Temporality · Legislation · Data-Wrangling

1 Introduction

"Of all the things that are powerful in constraining the choice set, in shaping the way we think, time and the way learning is embodied in history are certainly among the most powerful. ... I will be blunt: Without a deep understanding of time, you will be lousy political scientists, because time is the dimension in which ideas and institutions and beliefs evolve" [1, p. 361].

Rome wasn't built in a day. This proverbial phrase holds for various aspects of life. Moreover, it seems relevant when speaking of policy goals and their implementation: Time is often regarded as an indicator for the quality of democratic decision-making or the efficiency of policy-making [2–6]. Acceleration of decision-making, a break-neck pace of legislation or a short duration of the processes of law-making are seen to dilute the legitimacy and to deteriorate quality of any political decision. Episodes of high law-

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making density [6] are associated with the parliament's dwindling power of participation, resulting in a lack of parliamentary oversight [4]. In contrast, long duration of policy-making is also seen as an expression of inefficiency [7]. Usually, two reasons for taking (too) little time are given: 1. Desynchronisation of political and societal systems makes it mandatory that the legislative power reacts to exogenous stimuli of adaption. Hence, it adapts its reaction time in order to live up to its aspiration as an actively creating force. 2. To enforce their policy goals, political actors influence political processes by using time strategically. Hereby time serves a double purpose as instrument of power and as resource [5, 8–10].

Obviously, the temporal component of policy-making is of scientific and societal relevance. Yet in both, theoretical discussion and empirical examination, the reasons for temporal patterns in legislation, the impact of temporal rules and the significance of intentionally time-related actions in legislation have been neglected [3, 11]. At least for Germany, this is essentially explained by the lack of a database which could provide a broad foundation upon which to rest comprehensive, quantitative analysis. The paper at hand introduces such a database. In the following, the necessity of this tool will be explained by elaborating on the state of the art regarding temporal analysis in political sciences. The three temporal components of legislation will be outlined: duration, pace and acceleration, as will be the resulting challenges for political sciences research. Subsequently, the data-wrangling process achieving the database will be described. The paper will conclude with suggestions for future research.

2 Temporality as a Subject of Political Science

Institutionalised temporal rules define time-measures, which sequence political events (like law-making processes). These rules constitute political proper time, in other words they constitute the rhythm for policy-making [12]. Political proper time is defined as all temporal patterns and structures of the political decision-making process, or more precisely, it involves all sequences of decision-making which result in collectively binding decisions [11]. This polity-dimension contains the central democratic time unit: the election period of parliament and government [7]. Its key role is highlighted by the fact that all political actors plan their activities along this limiting time frame – organised in yearly session calendars including e.g. sessions weeks and vacations –, even more so in Germany as legislative initiatives are subject to discontinuity. Discontinuity means that the legislative process of all bills ends with the election period of parliament. Furthermore, pertaining to this polity-dimension are any temporal rules derived from the German Grundgesetz or the law-making bodies standing orders. These rules define the chronological procedure of passing a bill (such as the number of plenary sessions or the order of sessions) and the way in which time resources are allocated between actors (such as speaking time or deadlines).

To elucidate the question as to how election periods influence policy-making, there is empirical evidence that political actors are likely to propose highly controversial bills at the start of a legislative period [6]. Other findings also show that policy goals which enjoy broad approval among a coalition tend to be prioritised with regard to their timing: "the policy agenda produced by coalition governments appears to be organized

in a fashion that accommodates the policy goals of [the cabinet as a whole]" [13, p. 457]. These two observations do not contradict each other, but illustrate the fact that temporal rules create (temporal) space in the politics-dimension which can be characterised as contested space [11, 14].

Political processes (the politics-dimension) serve as platforms for arguments over the interpretational superiority imposed on past events as well as the shaping of future events. Here political actors apply those temporal strategies which, based on their expectation, will be successful in implementing their goals. How flexibly temporal leeway can be used and how great any political manoeuvring room is, depend, not least, on the grade of detail with which political proper time is institutionalised. The above-mentioned temporal strategies become visible in legislatures and thus, these strategies gain remarkable societal relevance.

Any German legislative process is temporally structured, but multiple loopholes for political actors still remain in order to utilise temporal space and leeway as instruments of power in accomplishing their agendas [8]. Political science has come up with differing assessments of politicians' possibilities of strategic temporal actions. Some say that political actors have little possibilities to shape legislative temporality, because the institutional time-order define high functional responsibilities for upholding the legislative process which actors could hardly influence [6]. This structural burden relates to the fact that productive legislative processes can only be guaranteed when law-making actors abide responsibly to the overarching schedule of advancing a bill and finally passing it [6]. Contrary to this argument the temporality of legislative processes (their duration, pace and acceleration) can vary enormously. This dissents from the idea of narrowly confined manoeuvring room. Political actors act very well within these institutionalised schedules to either slow down or accelerate political processes: "politicians had to learn how to manipulate time, … into something that could be scheduled, anticipated, delayed, accelerated, … and even wasted – but never ignored" [15, p. 71]. Furthermore, federal law provides politicians with a legislative fast lane for example when focusing events, crises or any state of emergency occur [16]. In those cases it is less the crisis shaping the temporality of legislature, but the political actors' preferences for example to follow their (potential) voters' demands [8, 17]. But political actors can open fast lanes also due to other reasons like the end of the legislative period.

Moreover, particularly parliamentary government factions in the German Bundestag hold immense sway over the temporal order of the parliament's agenda. Decisions on the parliamentary agenda taken in the parliamentary advisory committee will by tradition be made unanimously or at least with the support of an overwhelming majority, but under no illusion the parliamentary agenda could be changed by a vote of simple majority, for example by the government factions, at any time [18].

Lastly, with regard to the policy-dimension temporality refers to concrete time horizons of policies. This includes the duration of validity of any political decision: at which point in time will they come into force, (when) will they have to be evaluated, and how long will they stay in power? Questions about policy-timing also belong to this dimension [8].

Empirical research on temporal intricacies of policy-making has so far merely dealt with some individual aspects. This implies studies on the relation between the timing of

a legislative initiative and the duration of the law-making process of (contested) policies [3, 8, 13]. The acceleration of legislation as a reaction to an accelerated environment is subject of political science research, too [5, 10, 19, 20]. Particularly for the German case most work is done regarding the influence of decision-making within a federal state on the duration of legislation [21–25]. Additionally, there is research on the reasons why a particular bill might be successful or not. Temporal aspects of policy-making are thereby either explicitly or implicitly considered contemplated against the backdrop of success factors – from the perspectives of institutions, partisan strategies or party programmes [26–28]. In all of these studies the complexity of a bill is rarely considered as a reason for its temporal characteristics. But this is of importance to conceptualise pace as one legislative temporal component. Moreover, political science lacks an analysis which puts the explanation of temporal patterns in decision-making at its centre. Additionally, as far as these studies try to answer questions regarding the temporal dynamics quantitatively, they lack an exact database: "For example, such a study might involve an analysis of the number of committees to which a bill is referred …, the number of hearings scheduled, the number of expert witnesses invited to testify. At the moment, such data are not available in systematic fashion" [4, p. 17].

Hence authors circumvent this void by citing the duration of legislation, since valid data on the point in time when the bill was initiated and its final passage is available. This is in Germany thanks to the Dokumentations- und Informationssystem für Parlamentarische Vorgänge (DIP) (an information-system on all parliamentary proceedings of the German Bundestag). However, the duration is inadequate to answer most of the temporal questions. For example, a longer duration of legislation might coincide with extensive consultations, numerous committee meetings, public hearings or the appeal of a mediation committee. Yet only the number and type of actions truly allow insight into the extent of parliamentary revision. Similar problems emerge during the analysis of acceleration of policy-making. Those studies show that the nuances of temporal actions are hardly accessible methods of quantitative research as long as we do not have an adequate database [11].

3 Temporality of Legislation

The course of legislation and its associated formal temporal rules are defined by the German Grundgesetz, the Joint Rules of Procedure of the Federal Ministries (GGO), the Rules of Procedure of the German Bundestag, as well as the Rules of the Mediation Committee and of the Bundesrat. As Fig. 1 shows in Germany Federal Government, Bundestag and Bundesrat have the right to initiate bills. These constitutional bodies can therefore declare the formal temporal starting point (the policy-timing) of a bill. More detailed and delicate fine-tuning of any bill will be done in the respective specialised committees of Bundestag and Bundesrat. The type and total number of committees involved are contingent on the subject matter. The committees' work is flanked by plenary sessions in Bundestag and Bundesrat. Usually, a bill is formally read three times in the Bundestag's plenary sessions and can be discussed (up to) two times in the Bundesrat's plenary sessions. Yet this does not include possible further plenary

decisions which follow a mediation procedure. After passing a bill, the federal government will sign it, the head of state will promulgate it and it will become written law after having been published in the Federal Law Gazette.

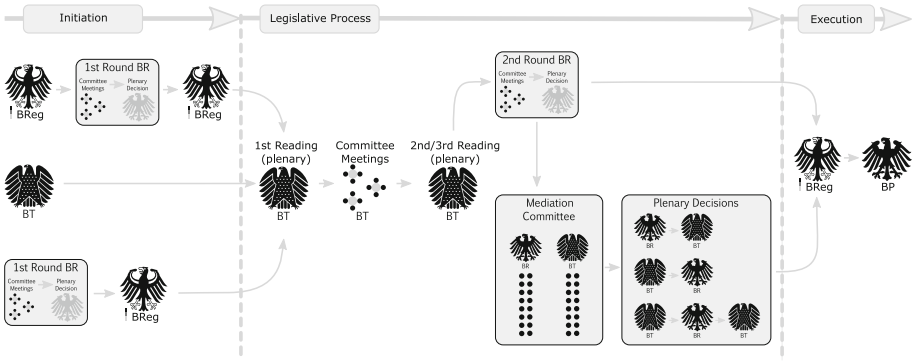

Fig. 1. German legislative process; abbrevations: BReg = Bundesregierung (Federal Government), BT = Deutscher Bundestag (German Federal Parliament), BR = Bundesrat (German Federal Council), BP = Bundespräsident (Federal President)

In the years 1990 to 2009, 2592 laws have been promulgated and published. Depending on their complexity, cross-party consensus, public attention or urgency each bill's legislative run can differ immensely, ranging from three to exceeding 1300 days [8].

Why was existing quantitative data insufficient to analyse the temporality of legislation? Existing data can merely and this only partly lead to conclusions on the duration of legislation, but they cannot lead to comprehensive conclusions on pace and acceleration, whereas the scientific discussion is reasonably focusing around causes and effects of pace and acceleration of policy-making [2, 5, 6, 10–12, 20, 29]:

The duration of law-making indicates how much time will have passed from the start to the end of any political process [29]. Defining the start of a legislative process, however, is not always self-evident when various propositions are discussed simultaneously. The starting point of a policy is formally determined by the fact that ordinarily one of the simultaneously discussed propositions poses as the so-called basis of the law-decision. As a premise, statistical data of the German Bundestag always rest on the starting point of the bill which has formally and finally been declared as the basis of the law-decision. Every other meeting concerning the other propositions of similar content is not considered, since they, from a formal standpoint, are viewed as propositions in their own right. In some cases, this analytical blind spot might distort the actual duration of a policy becoming law. Initiatives from the Bundestag for example do not require a so-called first round (erster Durchgang) in the Bundesrat, but for initiatives of the Bundesregierung it is mandatory. At times federal government and parliamentary government factions introduce identical versions of a particular bill at nearly the same point in time. This can cut short legislative processes, which affects their duration. If it is the aim to analyse temporal idiosyncrasies of policy-making, then the process and

time resources utilised need to be looked at in their entirety. At least, a comparison is required which sheds light on how strongly certain periods of legislative process can differ, when not purely examining the formal course of a bill, but also studying its progression with regard to content.

Considering duration alone will not suffice to make claims about the temporality of legislation. Duration is a descriptive measure for the temporal action arena of each legislative process. It might be short or long or something in between. In principal, a long legislative duration might open up room for manoeuvre, but how does this pay out in reality? The temporal length of law-making actions thus holds only limited explanatory power, as long as it remained unidentified how many and which kinds of legislative steps were undertaken throughout a certain period of time. Whereas, if the duration of a law-making process is combined with the complexity of a bill as well as with the number and types of events (for example the number of committee meetings), this will bring light into the pace of legislation: A process with a long duration and few events is slow, with many events but few decisions (e.g. numerous adjournments of a bill during committee sessions) is not faster nor does it indicate, for example, any parliamentary control over government bills. Low priority of a bill could also account for its prolonged stay in the legislative treadmill. Thus, not only the number (which exposes how many times political actors have handled the issue at hand) of events have to be counted, but their results have to be weighted (e.g. decisions made). Therefore, it is crucial for any analysis of law-making pace to include each of these procedural steps.

The number and type of action have to be assessed in relation to each bills' complexity. Quantitative research has largely neglected the complexity of legislative bills. There are only few exceptions: Borghetto 2014 operationalises (inadequately) complexity by the length of legislative text [3]. And the so-called key decisions recognised by Beyme 1997 can be complex laws. But not all complex laws are key decisions. Key decisions are instead decisions of greater innovative potential and broader societal and political impact [30]. Yet the paper at hand argues that complexity regarding legislative proposals has a factual, an institutional, a political and a societal dimension. Law-making inherent variables for those dimensions are inter alia the following: The number of committees and related policy fields are variables for the factual dimension; so called consent or objection bill and required majorities for the institutional dimension. Party majorities in Bundesrat and Bundestag as well as a mediation procedure are variables for the political dimension; expert hearings and statements for the societal dimension.

Thus, defining the pace of legislation is by no means trivial. Unlike in the case of a car ride, the quality of the task varies. The physical unit of speed is based on a perennial task, covering spatiotemporal distance, measured, for example, in kilometres. Passing a law, on the contrary, calls for bridging a content-related distance. This distance will differ for each bill. The pace of legislation will therefore be deduced from 1. the complexity of a bill, 2. the number and types of processual steps undergone and 3. the duration of the legislative procedure.

The acceleration of policy-making is relevant because the pace within a particular policy can vary, as well as it is being volatile when comparing different policies: "Many political processes exhibit changing tempos: They speed up and slow down at given points." [29, p. 1288] Regardless of whether acceleration within a certain policy

or for every bill during a legislative period would be identified, firstly one would have to determine the inherent pace of a political unit of interest (for example a legislative process or a specific facet such as the second hearing in the Bundesrat). This has not been done yet. In addition, the term acceleration is often used imprecisely [10]. In common jargon, acceleration is understood as an increase in pace or speed, and this understanding has also been adopted in social sciences. Acceleration is volume increase per time unit, it is said [5]. But it can either be greater than zero or below zero (which would commonly be referred to as slowing down). Yet acceleration has to be defined as the measure of the change rate of pace. Even though these challenges are obvious, acceleration of political action is currently the temporal category primarily addressed in political science research. Sociological findings on the challenges imposed by societal and technological transitions are tied to answer the following questions: In which way should politicians act in an ever hastening world of an asynchrony between environment and system? How far can political systems gain time to make essential decisions? How should democratic political systems organise deliberative decision-making under these conditions [5]?

4 Description of the Database

The so-called Parlamentsdokumentation of the German Bundestag maintains a database on all bills initiated. Their Documentation and Information System (DIP) hereby provides access to the public part of these legislative material, like the legislative text or plenary session records. These legislative material form an indispensable basis of legislative transparency and they inform about main law-making issues and related temporal aspects. The raw data has partly been made available for research work already. Meanwhile, the data of the 16th, 17th and 18th legislative period can be retrieved in XML format via a static HTML page in machine-readable format. This data can be exported. Yet the information contained in this database is far from sufficient for the analysis of duration, tempo and acceleration of legislation: Firstly, the DIP documents legislative processes only for one concrete submission at a time. Secondly, the DIP solely notes a few selected actions of the whole legislative processes, such as the date of entry into the Bundestag or Bundesrat or the date of plenary sessions. These events are central events that take place in every legislative process. In addition to these mandatory acts, the DIP documents when a mediation committee has met and whether a public hearing took place. The DIP does, however, not list every single law-making step.

For these reasons, a machine-readable database is needed that lists any distinct event occurring within a legislation and which contains information providing insights on the complexity of any negotiated bill. The legislative database presented below closes this gap by using the textual information of the parliamentary archives of the German Bundestag. These archives document almost every legislative step and store any document belonging to said workflow. Moreover, they record which bills (of same content) were discussed together. Thus, the legislative material of the parliamentary archives is the most comprehensive documentation available on federal legislation, published in the form of hard copies accompanied by content overviews (indices)

together with each hard copy. The content overviews are accessible online as PDF files. The database extracts – computer-aided – the desired data on legislative processes from these content overviews (which are currently obtainable from the 8th legislative period onward). Nevertheless, a few gaps remain: meeting dates of the defence committee, for example, are not disclosed and therefore not properly listed. Similarly, works of sub-committees which are only occasionally installed are not fully documented. In addition, an allocation of the exact subject-field, for example via so-called finding aids (Fundstellennachweis, FNA) or via the subject-scheme of the GESTA (Stand der Gesetzgebung des Bundes) is excluded from the parliamentary archives' overviews. Fortunately, Juris GmbH has made the FNA and GESTA numbers available for integration into the database. Currently the database contains all legislations between 1990 and 2009 (12th to 16th election period).

4.1 Technical Workflow

All content overviews are provided in PDF format. Unfortunately, these documents have been varying over time with regard to their layout and spacing. For further processing it is essential to translate these documents into a structured representations. An overview of the technical workflow for the extraction of the data is shown in Fig. 2 and explained in subsequent sections.

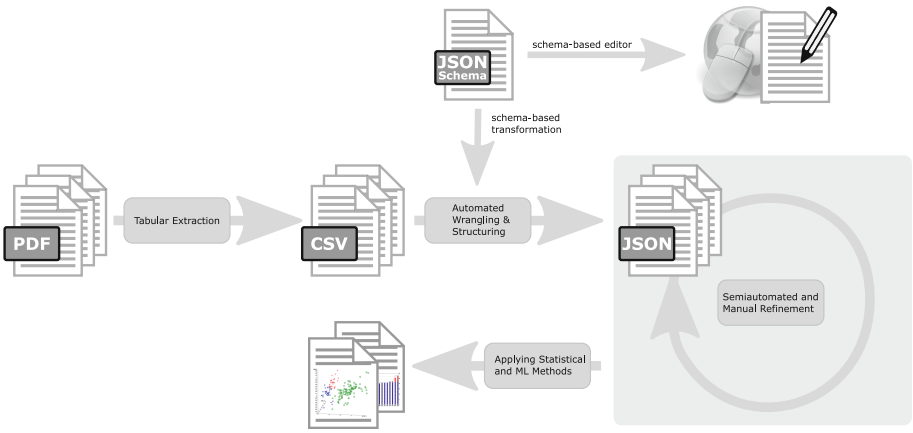

Fig. 2. Data-Wrangling-Process to setup the database

4.2 Schema Definition and Editor

The content overviews consistently contain the same type of information: title, diverse identification numbers, the committees involved, a listing of the legislative material which informs about every single law-making step and date (grouped by general phases and once more sorted by working steps within each of those groupings) as well as additional material such as press or official statements. All content is ordered – by consecutive numbers – along the temporal logic of its respective law-making process.

This logic can be formalised by a schema-language that captures document structures and types of content. Thus, the content overviews can be exchanged and interpreted by machines.

Recently, the JSON format became the de facto standard beside XML format for sharing structured machine-readable data. Even though XML is considered to be human-readable, JSON is more concise and easier to work with. Therefore a JSON schema is used (instead of the better known XML schema definition XSD) to assert a consistent definition of the structure and type of data given in the content overviews. Through this JSON schema it is possible to generate a form-based editor which handles the documents in the database besides using existing text-based JSON editors. The former one ensures that any user is only able to craft syntactically valid documents; the latter gives hints when users violate the JSON schema during editing. Experienced users are more time efficient when working with the text-based editor. This is of importance, because the generated machine-readable data have to undergo a manual reassessment process. But both editors are not intended to translate the above-mentioned PDF documents manually (and from scratch) to a schema-conform JSON document. Instead, an automated approach that is at least partially capable to derive these documents from their sources may save copious amounts of time and is therefore the only economically reasonable option when building an extensive database. Thus, there is an obvious need for the original PDF documents to be automatically transformed.

A number of algorithms exist which learn layout and spacing parameters in order to extract tabular representations from documents and return these for example in CSV format. For the database a cloud-based service (pdftables.com) was used. It applied such an algorithm to the overviews of legislative procedures in PDF format. By using this service all content overviews from 1990 to 2009 were transformed from PDF to CSV. Newer ones have not completely been archived as of now, while older ones hit the algorithmic limitations due to the bad quality of the scans.

4.3 Automatic Post-Processing and Transformation

Even though the above-mentioned automated extraction generates reasonable results, variations in the tabular representations occur due to errors such as incorrectly identified alignments or rows. To cope with these issues, a further processing step has been implemented that rectifies known difficulties of the parsing process. This increases robustness regarding the mapping of detected elements with respect to the JSON schema. The general procedure here is to separate the concerns of extracting (1) the general information of the legislative process dealt with, (2) the committees and (3) the law-making material, which are sorted by consecutive numbers. The content overviews are subdivided into sections and embeddings of sections based on rules determined by row size and specific regular expressions that indicate an end or a new start of such a section. Within a section regular expressions are applied to extract information associated to a given concern. They are defined in such a way that they capture all common variations that may occur with respect to column-size variations, to filter irrelevant parts from relevant ones and to deal with variations in notation or occurring typos

(some of them may be captured, others may be not syntactically distinguished and need a manual, contextual and semantic rectification).

Internally, the resulting JSON structure is successively built up while extracting the information of interest. Hereby, the law-making material is the most difficult part of the document. Here we find an order that follows the responsible institution (like Bundestag, Bundesrat). All responsible institutions have to be identified correctly. All consecutive numbers have to be correlated with the right institution. Moreover, additional entries (like enclosures) which do not have their own number but do relate to a consecutive number have to be assigned. All lines that are hereby not handled are written to the error output of the process in order to serve for manual monitoring and debugging purposes.

4.4 Semi-Automated and Manual Refinement Cycle

The obtained schema-conform documents can be refined regarding errors in the original documents, issues that occurred due to transformation (where some of these sort be inevitable to decide on syntactical level and therefore requires contextual embedding or semantical relation for decision).

The above-mentioned refinement process makes use of the generated web-based editors. Further, it incorporates a version control system which keeps track of contributions made for example by different individuals. By doing so it is assured that each contribution may be reviewed by another person and changes can be rejected or reverted at any time, if required.

5 An Appeal for Future Research

Democratic participation and the inclusion of interests have always been the pillars of a flourishing democracy. As the centrepiece of German policy-making the federal government, Bundestag and Bundesrat, have come under increased scrutiny over the past years. Legislation was too fast or too slow, the criticism went. The acceleration of policy-making to cope with an accelerated environment decreases the influence of parliament (the so-called Entparlamentarisierung) is said on the one hand [5, 10, 19, 20]. On the other hand, it is complained that political actors are not able to give efficient answers to urgent problems. Frustration and declining political interest seem to be the results of this. But little attention – at least quantitatively – has been paid to the question what exactly can be said about the temporal aspects of policy-making aside from subjective perceptions which are dependent on one's own position and interests. What is the quantitative evidence for the above-mentioned sentiments?

The described database lays the groundwork for the examination of the legislative process and its temporal patterns and oddities. It contains the necessary information to answer temporal questions on law-making: What exactly is the duration, pace and acceleration of law-making? What are, for instance, causes that are inherent to the law-making process for a slow or fast pace [31]?

Here, the number of actions, the complexity of the bill, public hearings or the subject field might be reasons for a change of pace. The database is a device to address

these questions: Its structured content can be used in order to build variables of interest or to aggregate information. Further methods of analysis of an arbitrary type can be applied such as basic statistics, methods for statistical inference or even more advanced ML methods which may learn complex structures or patterns. Additionally, the data as well as the results of the analysis can be visualised to give additional, intuitive insights from the available data and to shed some light on temporal patterns of the law-making process. Thus the database proves to be a beneficial tool to enable critical analysis and versatile research on the many proverbial pulses of politics.

It really is about time.

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Policy Informatics in the Social Media Era: Analyzing Opinions for Policy Making

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Abstract. In order to address the complexity of the modern social problems and needs through effective public policies, government agencies have started experimenting with policy informatics methods, adopting various approaches that increase citizens' and stakeholders' participation in the public policy formulation processes. Such approaches allow the exploitation of their opinions, which incorporate valuable perceptions of them, as well as knowledge, proposals and ideas. This paper outlines three advanced methods of social media (SM) exploitation in public policy making processes for citizen-sourcing, which are based on the concepts of active citizen-sourcing, passive citizen-sourcing and passive expert-sourcing respectively, as well as the conclusions from some first applications of them. Based on them a comparison of these methods is conducted, and then a maturity model is developed concerning the use of SM for citizen-sourcing in order to support policy making.

Keywords: Policy informatics · Social media · E-participation
Crowdsourcing · Citizen-sourcing · Expert-sourcing · Maturity model

1 Introduction

With our society becoming more and more heterogeneous and pluralistic in terms of culture, values, concerns and lifestyles, the social needs and problems become more complex and 'wicked', creating needs for new approaches in order to cope with them [1, 2]. These approaches necessitate government agencies to collect and process a large amount of external information concerning the different issues perceived by different problem stakeholder groups for the specific social problem under investigation, as well as the different solutions they propose and arguments in favor and against them, and in general their different concerns. Contemporary governments are responding to these challenges, by moving away from the 'elitist model' of public policy development, in which managers and experts are the basic source of policies, towards a new more 'democratic model', in which the citizens have an active role and voice as well in public policies' formulation. This has resulted into the adoption of the 'participative democracy' ideas, which are based on the extensive involvement of stakeholder groups in the formulation of public policies [3, 4]. In this landscape, policy informatics has emerged as a field studying how information and communication technologies (ICT) can be

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leveraged in order to understand better complex social problems and needs, develop public policies for addressing them, and realize innovations in governance processes and institutions [5, 6]. Policy informatics uses modern computational methods to process vast quantities of data, mine data from single and multiple sources, seek patterns in multidimensional data, and develop models of various phenomena.

In parallel, the increasing availability of online user-generated content and the new ICT-based means of interactions between decision-makers and citizens has brought new potentials for collecting and analyzing citizens opinions, which incorporate valuable perceptions of them, as well as knowledge, proposals and ideas. Web 2.0 and Social Media (SM), constitute a 'paradigm shift in communication', which lowers the barriers of communication for individuals and groups, and brings new potentials to foster and support e-participation. This has led to the emergence of new opportunities for the 'policy informatics' field, based on approaches, methods and processes that incorporate Web 2.0 functionalities and architectures, and social networking tools, in combination with advanced text processing techniques for analyzing the huge amount of collected policy-related textual content. However, there is limited knowledge on how these ideas can be efficiently and effectively performed in the special context of the public sector, and supported by appropriate ICT platforms. This necessitates extensive research for the development of methods for the effective exploitation of SM in government, in combination with advanced text processing techniques, for supporting problem solving and policy making.

This paper makes a contribution in this direction, by outlining and comparing three advanced methods of SM exploitation in public policy making processes, developed as part of European projects, and synthesizing the results of their application and evaluation from various perspectives in order to develop new knowledge in the "Policy Informatics" area. Finally, based on our conclusions a maturity model is developed concerning the exploitation of SM by government agencies for policy oriented citizen-sourcing.

The paper is structured in six sections. In the following Sect. 2 the background of our research is presented. Then, the three SM exploitation methods and their underlying ICT platforms are briefly presented in Sect. 3, while their pilot applications are outlined in Sect. 4. A comparison of the proposed methods is presented in Sect. 5. Finally, in Sect. 6 the conclusions are summarised.

2 Background

The great potential of the 'collective intelligence', defined as a 'form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills' [7], to contribute to difficult problem solving and design activities has triggered the interest in the adoption of crowdsourcing in the public sector. While many government organizations do not explicitly use the term, they increasingly attempt to use crowdsourcing ideas and practices in order to encourage collective problem solving in co-operation with external stakeholders (e.g. citizens, professional and sectoral associations, etc.). However, much less research has been conducted on the application of crowdsourcing in the public sector, focusing

mainly on 'citizen-sourcing', than for the private sector crowdsourcing [8–10]. Citizen-sourcing can lead to the application of open innovation ideas in the public sector, as it changes government's perspective from viewing citizens as "users and choosers" of government services to "makers and shapers" of them.

The first citizen-sourcing initiatives aimed at the collection of policy-related information, knowledge and ideas from the general public, in order to support the development of better, more effective and acceptable public policies. So most of the initial government citizen-sourcing research is focusing on the 'active citizen-sourcing' paradigm, which uses government agencies' web-sites or social media accounts in order to pose 'actively' a particular social problem or public policy (existing or under development), and solicit relevant information, knowledge, opinions and ideas from the citizens (the general public) [11, 12].

Later, there has been research interest in the 'passive citizen-sourcing' paradigm, which aims to exploit 'passively' policy-related content that has been generated by citizens freely, without any direct stimulation or direction by government, in various external (i.e. not belonging to government agencies) web-sites or social media, such as political fora, news web-sites, political blogs, Facebook, Twitter, etc. accounts; the analysis of this content can provide useful information, knowledge and ideas concerning important social problems and public policies [13–15].

The assessment of the first citizen-sourcing initiatives revealed that they can provide useful insights about the perceptions of the general public concerning important societal problems and existing or prospective public polices for addressing them. However, they concluded that due to the high complexity of modern social problems and needs that had to be addressed through effective public policies, it would be highly beneficial if this general public oriented citizen-sourcing could be combined the collection of information, knowledge and ideas from experts as well. This lead to the emergence of the 'expert-sourcing' paradigm, which is in line with previous political sciences research on the role and importance of both 'democracy' (democratic processes and consultation with stakeholder groups) and 'technocracy' (specialized knowledge of experts) for the development of effective public policies [16, 17].

However, these different types of citizen-sourcing and expert-sourcing practices, aiming at the collection and analysis of public policy related information, public opinion, knowledge and ideas from experts' and citizens' communities, constitute innovations in the Policy Informatics field, and there is limited knowledge concerning their advantages, disadvantages and application in policy formulation processes in general. So, extensive further research is required in this area, in order to improve existing and develop new citizen-sourcing and expert-sourcing paradigms. The following sections outline some research that has been conducted in this direction, and attempt to synthesize their findings.

3 Three SM-Based Citizen-Sourcing Methods

For reasons of completeness of this paper, the three following subsections provide an outline of three SM-based methods that have been developed as part of European projects: an active citizen-sourcing method (Sect. 3.1), a passive citizen-sourcing

method (Sect. 3.2), and a passive expert-sourcing method (Sect. 3.3). Also, in each subsection references are provided that describe in more detail the corresponding method.

3.1 An Active Citizen-Sourcing Method

The first method aims to conduct centrally managed online consultations on public policies, or social problems/needs, which are defined by the organizer government agency (so it performs 'active' citizen-sourcing), in multiple accounts of it in various SM. A central ICT platform is used in order to initiate, manage and monitor a policy consultation in multiple SM accounts of a government: initially are publish relevant messages on them, which define the topic/question of the consultation (it can be a public policy, existing or under development, or a social problem/need), and then the citizens interact with these messages through their accounts in the underlying SM [18, 19]. Both messages/content posting in these multiple SM accounts and continuous retrieval of citizens interactions with them (e.g. comments, likes, shares, etc.) are performed in a automated manner using the API of these SM from the above central ICT platform, in which also processing of these interactions (using advanced text analysis techniques) and results presentation takes place. The results include advanced analytics, based on advanced processing of citizens' textual inputs (e.g. blog postings, comments, opinions, etc.) using text analysis and opinion mining techniques. In particular, the following tasks are performed: (i) sentiment analysis, which classifies opinionated texts (e.g. blog posts, comments) as expressing positive, negative or neutral opinions, as well as the overall sentiment of citizens' comments submitted within a policy consultation, and (ii) issues detection, which identifies specific issues frequently posed by the citizens. This advanced processing is used to discover the public stance on the various issues of a policy topic. Another sub-component performs simulation modelling (Decision Support Engine), having mainly two objectives: estimation of the outcomes of various citizens' proposals on the public policies under discussion, and also forecasting the future levels of citizens' interest in and awareness of these policies. This method has been developed as part of the PADGETS project (www.padgets.eu).

3.2 A Passive Citizen-Sourcing Method

The 'passive citizen-sourcing' method aims to exploit the vast amount of citizens-generated content beyond the SM accounts of government agencies, in 'external' Web 2.0 sources (i.e. not owned by government agencies, such as various political blogs, newspaper discussion forums, etc.), in order to provide to governments a better understanding of public needs, wishes and perceptions of citizens, as well as ideas, to be taken into account in the policy making process [14, 20]. An ICT platform has been designed for supporting the application of this method within the NOMAD project (www.nomad.eu), which consists of services that: (i) create and maintain domain models, i.e. graphical representations incorporating the main entities-terms of the domain of government activity in which the specific policy aims to intervene (e.g. energy, education), as well as policy models incorporating the main elements of the

public policies under investigation (policy modelling), (ii) then use such policy models in order to mine relevant citizen generated data from a variety of pre-defined online external sources (through crawling services), (iii) perform linguistic analysis of them to transform free text into a set of structured data, (iv) discover and extract main issues discussed, as well as arguments from free text (argument extraction), (v) perform sentiment analysis to classify text segments according to their "tone" (positive, neutral, negative), (vi) cluster arguments, based on calculated similarities, and present automatically-generated summaries (argument summarization), and (vii) visualize a structured view of citizens' opinions on a policy related topic (through word-clouds and other kinds of charts), providing insights on what about, how much and when citizens are discussing concerning this topic (visual analytics). In this approach government does not define topics/questions of consultations; it remains passive, and just 'listens' to what citizens discuss on a specific policy, and analyze the content they freely produce in order to extract relevant knowledge (so it performs 'passive' citizen-sourcing).

3.3 Passive Expert-Sourcing Method

This third method provides the main capabilities of the previous one (outlined in Sect. 3.2), but combined with filtering of the retrieved content, based on creator's reputation (enabling a focus on more reliable content created by high reputation authors) as well relevance with our pre-defined topic of interest. In particular, it is a 'passive expert-sourcing' method, based on the automated retrieval from multiple online sources at regular time intervals of information about experts on various policy related topics, as well as relevant online texts, documents and postings already published by such experts in multiple social media and web-sites. Data about individuals possessing high levels of knowledge, expertise and credibility in one or more predefined topics are collected and included in the corresponding database automatically, or even can be entered manually by interested individuals through self-registration. In addition, rankings of the expert profiles on one or more topics, based on their relevant expertise, through 'reputation scores' are calculated by a reputation management algorithm based on several criteria with different weights. Another component of the ICT platform supporting this method, crawls relevant documents (blog posts, social media content, online comments, word/pdf documents, web pages, etc.) concerning the above predefined topics of interest. These documents are associated with the most relevant policy topic and subtopics, and possibly linked to one or more authors of the above individual experts'. Next, for each document its quality is rated with respect to the above policy topic/subtopic(s) and undergoes sophisticated processing using text/opinion mining and sentiment classification techniques, in order to assess their sentiment (positive, negative or neutral). By storing the above data in a common database, enabling search of it by the users and visual presentation of the results, public policy stakeholders are able to identify useful expert knowledge on complex policy debates, i.e. the most reputable/credible experts or the most relevant documents on a specific topic A comprehensive description of this method is provided in [21].

4 Applications

The proposed citizen-sourcing methods have been applied in real policy scenarios and evaluated through pilot applications organized in cooperation with governmental actors (government agencies, members of national and European parliaments, public officials, etc.) in order to identify their strengths, weaknesses, barriers, limitations, as well as appropriate improvements and adaptations that will favor their practical usefulness and integration in the policy making processes. In order to build multi-perspective frameworks for the evaluation of the proposed methods, we draw elements from previous research in management science (concerning risks of crowdsourcing [22, 23] and diffusion of innovation theory [24]), political science (concerning wicked problems theory [2]), and IS research (TAM [25]) (see [14, 26, 27] for more details). In order to combine the advantages of the qualitative and the quantitative techniques [28] we used mixed methods of data collection, i.e. focus-group discussions, one-to-one interviews, and surveys.

The active citizen-sourcing method outlined in Sect. 3.1 has been evaluated through three pilot applications, in cooperation with members of the European Parliament. At the end of each pilot application the following data have been collected and analyzed: (i) Social Media Metrics as provided by the SM accounts of the consultation initiators and the Google analytics engine and (ii) textual input of the participants were retrieved and analyzed using the opinion mining capabilities of the ICT platform in order to extract the main topics mentioned and the corresponding sentiments. All textual inputs by citizens were examined in more detail, in order to be classified into issues/concerns, solutions/activities, advantages and disadvantages/barriers. Figure 1 shows an example of such classification in one of the pilot applications.

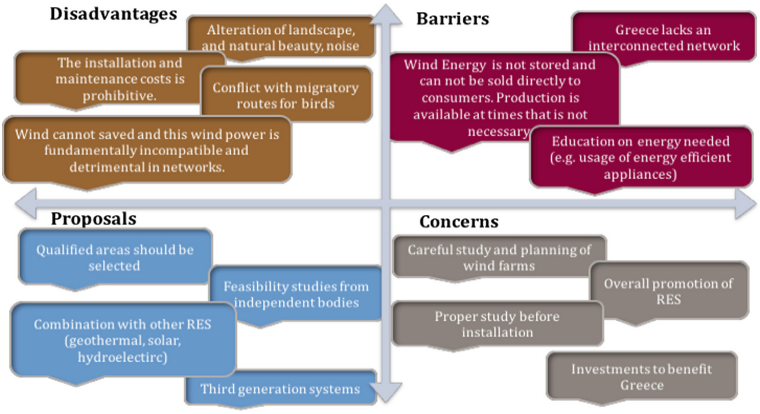

Fig. 1. Examples from the textual input of citizens in one of the active citizen-sourcing pilot applications

From this evaluation it has been concluded that this active citizen-sourcing method enables interaction and consultation concerning specific social problems/needs and

public policies with wider and more heterogeneous audiences than other alternatives used by government agencies for this purpose, in shorter time and at lower costs. Furthermore, it assists in the analysis and elaboration of the particular problem/policy under discussion, as the identification of a wide range of particular issues and dimensions perceived by the citizens with respect to, leveraging relevant collective knowledge and experience. However, the method seems to be less efficient in the generation of solutions and the facilitation of convergence among stakeholders' views.

With respect to the passive citizen-sourcing method outlined in Sect. 3.2 three pilot applications have been conducted, in co-operation with the Greek and the Austrian Parliament, and the European Academy of Allergy and Clinical Immunology (EAACI), on topics that reflect important current debates and interests of these organizations. In Fig. 2 we can see a visualization of the results derived in one of these pilot applications, concerning the energy policy.

Fig. 2. Results visualization of the "Energy" pilot application of the passive citizen-sourcing method (Color figure online)

In particular, the upper left visualization provides a word cloud of the most frequently issues detected in the accumulated content concerning the energy policy, while the upper right visualization provides charts on the volume of textual content found that is relevant with specific elements of the constructed policy models entities explained in

Sect. 3.2 (policy statements or arguments). Then, the visualization in the middle of Fig. 2 indicates example of text excerpts that have been found in the crawled Web 2.0 sources and characterized as positive or negative arguments by the opinion mining analysis (indicated with green or orange color respectively). Finally, the visualizations in the lower part of Fig. 2 indicate the overall sentiment distribution in the retrieved content, the distribution of the volume of content found per type of source, and the evolution of content over time.

From the evaluation of these pilot applications it has been concluded that this passive citizen-sourcing method can provide considerable support for public policy making, by enabling the low cost and fast assessment of citizens' feelings/attitudes concerning a prospective or existing policy, and also the identification of particular issues posed by the society concerning this policy. Furthermore, it allows to a lower extent the collection of proposals concerning possible problem solutions and policy interventions. However, this method has some inherent risks, associated: (a) with the misuse of it for promoting individual interests (by reporting selectively only a sub-set of its results, which is in the desired and supported directions by specific stakeholders, and hiding some others); and (b) with the possible intrusion into citizens' private sphere (so it is necessary to avoid content sources in which contributors perceive their postings and discussions as private). Critical success factor of this method is the selection of an extensive, diverse and representative set of high reliability and quality medial sources to be monitored.

Finally, for the evaluation of the passive expert-sourcing method outlined in Sect. 3.3 three pilot applications of it have been conducted, concerning three important EU policy related topics agreed among the 'EU-Community' project partners: Innovation and Entrepreneurship, Energy Union and Future of the EU. In Fig. 3 we can see some typical results visualizations. In the upper part we can see the detailed information about a specific document retrieved on a policy of interest. This information includes the results from the sentiment classification provided by the opinion mining algorithm regarding its polarity and as well as ratings and comments on it as input provided by other users. The lower part of the figure also presents a visualization of the sentiment classification of all documents retrieved within the application on the topic "Innovation & Entrepreneurship", ordered by temporal order of their appearance.

From this evaluation has been concluded that this passive expert-sourcing method has high levels of usefulness for the collection of high quality information and knowledge concerning all main elements of important social problems that have to be addressed through public policies: particular issues, proposed actions/interventions, advantages and disadvantages of them. Therefore it can make a significant contribution, and more multi-dimensional than the other two abovementioned citizen-sourcing methods, towards addressing the fundamental difficulty of modern policy-making: highly complex and 'wicked' social problems to be addressed [1, 2], with many issues, proposed actions/interventions, with each of them having various advantages as well as disadvantages, and also multiple stakeholder groups with differing views and perceptions about them. Furthermore, this method has medium to high levels of usefulness for identifying existing attitudes/sentiments in the society towards the above main elements of important social problems under discussion, as well as their time wise change.

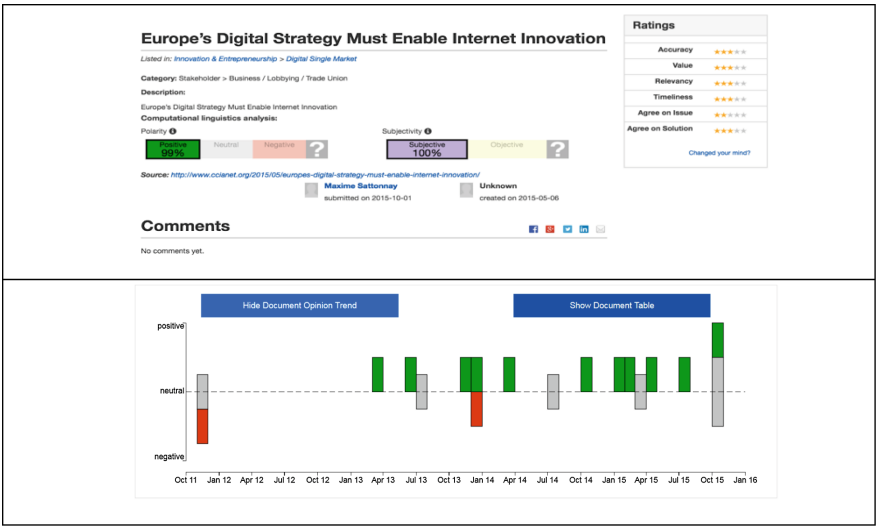

Fig. 3. Results visualizations of the passive expert-sourcing method

5 Comparison of Citizen-Sourcing Methods

In the following Table 1 we can see a detailed comparison among the three citizen-sourcing methods discussed in Sects. 3 and 4, taking into account the capabilities they provide, as well as the outcomes of their pilot applications. Part of the comparison criteria have been taken from the e-participation domain model proposed in [29].

The main differentiations of the proposed methods lie on the type of citizen-sourcing they perform (active or passive) and their targeted audience (citizens/general public or experts), while each of them also employs different but overlapping sets of technologies. All methods exploit multiple Web 2.0 SM simultaneously as content sources, in a centrally managed manner, based on a central ICT platform. The acquisition of data from them is automated by using their APIs, however for some of the selected data sources that didn't provided such APIs, the usage of specialized crawlers is essential. Then all methods make sophisticated processing of the collected content, in order to extract the most significant points from it, in order to reduce the 'information overload' of government decision makers and provide meaningful insights for the policy formulation process. For instance, they all employ opinion mining and sentiment analysis techniques in order to extract target groups' opinions from the collected SM content, as well as advanced visualized presentation of the results. However, in the case of the two passive citizen-sourcing methods the quantity of the accumulated content is much bigger than in the active citizen-sourcing ones, so much more sophisticated processing has to be performed. A major difference is that in the first two methods content analysis is conducted at an aggregated level, and not at individual author level, while, in the third method results are collected and presented on the basis of individuals recognized as experts. For this reason, the third method includes techniques of policy experts' profiling and reputation assessment and management, used for filtering collected content.

Table 1. Comparison among the three methods for SM-based citizen-sourcing

	Active citizen-sourcing	Passive citizen-sourcing	Passive expert-sourcing
Type of crowdsourcing	Active	Passive	Passive
Target groups	General public	General public	Experts
Involved actors	Policy makers Elected representatives (MPs)	Public sector employees Elected representatives (MPs) CSOs	Policy makers Elected representatives (MPs) CSOs
Level of participation	E-engaging	E-empowering	E-empowering
Stages in policy making	- Analysis - Monitoring	- Agenda setting - Analysis - Policy creation - Monitoring	- Analysis - Policy creation - Policy implementation
Data sources	Social media (Facebook Twitter YouTube Blogger)	Social media (Facebook Twitter YouTube Blogger Google+) Bing RSS Websites News sites	Blogs Websites (Institutions, media, NGOs/associations) Social media accounts (Twitter, LinkedIn) News sites
Data acquisition methods	Social media APIs	Social media APIs crawlers	Social media APIs crawlers
Processing methods	Social media monitoring Opinion mining/sentiment analysis Dynamic simulation Visualisation	Social media monitoring Opinion mining/sentiment analysis Argument extraction and summarisation Policy modelling Visual analytics	Social media monitoring Opinion mining/sentiment analysis Topic modelling Reputation management Policy modelling Collaboration support Visualisation

(*continued*)

Table 1. (*continued*)

	Active citizen-sourcing	Passive citizen-sourcing	Passive expert-sourcing
Rules of engagement	Social media interactions Textual input	Textual input	Textual input Documents Ratings
Accessibility	6000 citizens interactions from 3 EU countries	10,000 text segments from 2 EU countries and at EU level	800 documents at EU level

With regard to their application models each method demands effort in different phases. In particular, the application of the passive citizen-sourcing method needs more extensive work in the initial preparation, where domain and policy models have to be built by policy makers and domain experts. On the other hand, the active citizen-sourcing needs content posting by policy makers and their associates (defining the question/topic of the consultation, and providing some base information about it, e.g. relevant text, images, video, etc.); also, this SM consultation has to be advertised, both initially, and in the whole period it is active, in order to attract large groups of citizens. Finally, in the passive expert-sourcing method less effort is needed, which is mainly concentrated in the interpretation and filtering of the results.

In order to examine and compare the stages of policy making each of the proposed methods can be used for, we have used the model of policy-making lifecycle stages proposed in [30], which includes five stages: agenda setting, analysis, policy creation, policy implementation and monitoring. Since passive citizen-sourcing is an unstructured idea collection process, without any definition of a specific problem statement, it can be launched in the agenda setting in order to bring social problems or issues into the attention of governments and administrations. When the definition of the social problem is structured, and the targeted policy area is defined, active citizen-sourcing can be launched to trigger citizens' reactions on them and gather their perspectives. In the subsequent stages (the policy creation and implementation), expert-sourcing is more substantial, since expertise and specialized knowledge is essential for these stages. Finally, in the monitoring and evaluation stage it is crucial to convey citizens views on the implemented policies, therefore either passive or active citizen-sourcing methods (posing questions on particular aspects of the policies) can be employed.

The evaluation results have revealed the major advantages of 'passive' approaches over the 'active' ones: (i) they enable government agencies to access, retrieve and exploit much larger quantities of more diverse policy relevant content from a wide variety of social media sources of different political orientations; and (ii) this content already exists, so government agencies do not have to find ways to attract large numbers of citizens to participate in citizen-sourcing and generate new content.

6 Conclusions

In the previous sections of this paper a set of different approaches and methods for the exploitation of SM in government for supporting public policy making have been presented. Therefore, it provides some interesting contributions, which can be useful to both researchers in the policy informatics domain and government practitioners dealing with the public policy making. The findings from this research indicate that all the above approaches can definitely contribute to the timely collection of citizens' and as well experts' knowledge about social problems/needs as well as actions/interventions/policies for addressing them, taking advantage of the continuously growing Web 2.0 SM. So, they constitute valuable tools that can increase the quality, quantity and diversity of public opinion integrated and taken into account in public policy making. In general, the results revealed that although there are a number of risks associated with the application of these approaches (e.g. credibility and quality of collection information, manipulation of crowd), they are in general considered as effective and efficient methods for reaching wider and more diverse audiences at lower cost. Furthermore, the proposed approaches allow overcoming the usual 'information overload' problems of the traditional approaches, as they incorporate advanced content processing techniques, which are capable of extracting the main points of the collected content.

Based on the evaluation and analysis of these three methods we can distinguish a maturity model concerning the use of SM for citizen-sourcing by government agencies in order to support policy making. It includes the following five maturity stages:

I. Set-up and manual operation of multiple SM accounts: In this initial stage a government agency sets-up accounts in the most popular SM (e.g. Facebook, Twitter, YouTube), and operates them manually: content concerning its current services, activities as well as policies (current and future) is posted manually in each SM account, while citizens comments are read by public servants, and then summarized, and conclusions are drawn from them and sent to the appropriate interested units.

II. Centrally managed operation of multiple SM accounts: In this stage the posting of content on each particular topic is conducted from a central ICT platform automatically to all SM accounts of the government agency; this ICT platform also retrieves automatically citizens' interactions (e.g. likes, shares, comments) for each posting, and makes advanced processing of them to facilitate summarization and conclusion drawing.

III. External SM accounts central monitoring: In this stage, in addition to the centralized operation of the SM accounts of the government agency, we proceed to centralized monitoring of 'external' SM accounts and Internet sources in general, which have high quality content of interest, related to its activities and competences: interesting content is automatically retrieved, and then undergoes advanced processing, in order to facilitate summarization, main points extraction, sense making and conclusion drawing.

IV. External SM accounts monitoring with quality filtering: This stage combines the characteristics of the previous ones, with quality filtering of the collected policy

related content, based on the reputation of the author or/and the sources, aiming to provide information, knowledge and opinions from highly knowledgeable experts, and promote a 'democracy – technocracy' balance [16, 17] in the formulation of public policies.

V. Internal dissemination and consultation: This final stage includes the characteristics of the above stages II, III and IV, combined with ICT-based internal dissemination of the collected information, knowledge and opinions from the citizens' general public and the experts, and also internal consultation on them (e.g. through 'internal' SM); this facilitates collective sense making, assimilation, conclusions drawing, and better exploitation of them for taking action, making innovations and designing better policies.

It should be noted that the three SM-based citizen-sourcing methods are not mutually exclusive, but can be combined. Further research is required concerning the combination and 'interoperation' of different methods along the policy formulation stages for providing more substantial decision support to policy makers and social actors.

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Social Innovation

Understanding the Social Implications of the Digital Transformation: Insights from Four Case Studies on the Role of Social Innovation to Foster Resilience of Society

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Abstract. This paper advances further the analysis of previous exploratory research conducted by the authors on how social innovation can foster resilience in a digital governance context. The process of innovation in social policy, as well as the building of resilience implies changes in the existing status quo. ICTs can drive and steer such change, while at the same time they can act as counterbalance for the negative consequence of the digital transformation of labour markets on social protection systems. Understanding the logics and principles behind the design and implementation processes of exemplary innovative initiatives is thus crucial from a policy learning perspective, in order to identify the drivers and processes making this change happen and determining its outcomes. Based on an extensive body of literature reviewed, the framework proposed for interpreting the effects of social innovation in fostering resilience and its application are discussed through four case studies.

Keywords: Social innovation · Resilience · Governance
Digital transformation

1 Introduction

The digital transformation is impacting on the labour market and social protection systems for guaranteeing people well-being (e.g., promotion of employment, social insurance, and social assistance), pressing society and institutions to change [1, 2]. In fact, alongside the claimed advantages of this 'new industrial revolution', possible negative consequences for employees' identity in the workplace as well as for human resources management emerge [3], strictly related to the new forms of production that are promoted by such phenomenon [4]. Accordingly, the digitalization of society and work risks creating divides between top-of-the-scale jobs, mini-jobs, and unemployment as well as different degrees of freedom, leading to prosperity for some privileged, more precarious conditions for the masses, when not servitude for some part of the

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population. Consequently, it is urgent to understand and set the conditions for shaping a more resilient and inclusive society, capable to turn these risks into opportunities for all [5]. This paper aims to contribute to research on the relationships between social innovation and resilience within a digital governance ecosystem, and how to unleash the full potential of social innovation to provide effective solutions in addressing societal challenges and thus fostering resilience. To this end, the paper applied an interpretive framework developed by the authors to case studies from European Union Member States, including the UK (EU28), aiming to identifying patterns allowing to understand some of the social implications of the digital transformation, identifying value drivers and resilience effects and related governance paradigms.

The paper is structured as follows: Sect. 2 provides the theoretical background for the model and the case studies; Sect. 3 summarizes the main constructs of the model used for the interpretative framework further applied to the case studies, subsequently discussed in Sect. 4 before the conclusive remarks and future research directions are outlined.

2 Theoretical Background

Up to the current digital revolution, the resilience of society was mainly guaranteed by the Welfare State [6]. Among the different models, one has been recognized as representative by scholars supporting a convergence perspective [7, 8], the Bismarckian model presents an "industrial achievement-performance model", where the welfare state provides protection and benefits to those who contributed to its financing through employment contributions [5, 9]. According to the conceptualization of resilience by Manca et al. [10], the type of resilience offered by such a welfare model was mainly based on "absorptive capacity", that is defined as the capacity "to cope with and react to shocks or persistent structural changes by resisting to it" (p. 8). Taking these issues into account, for example, the social democratic model, based on a re-distributive function through "taxes against services" [11], was thought to be an adaptive approach to resilience. Also the Mediterranean welfare states can be seen as an institutional strategy to build resilience, where one of the main welfare producers was the family [12]. However, as anticipated, the digitalization of society, work, and economy, reduced the potential impact these models and their strategies (fiscal policies and incentives) were supposed to produce. Nevertheless, *absorptive capacity* is just one of welfare state components, while *adaptive capacity*, i.e. the capacity to adopt a degree of flexibility and make small changes to the system, raises as a new feature urged by the changing socio-economic circumstances in the modern era. After the financial crisis of 2008, then, it became clear that even considering the adaptive capacity it would not be enough to deal with emerging complex challenges [10] as welfare systems are path dependent institutions [13]. A main consequence of this is their resistance to structural reforms and a very low propensity to adapt. However, while the common vulgate represents the welfare state as one of the reason of increasing public expenditure and thus one of the trigger events of the sovereign debt crisis [14], a more informed analysis must underline that welfare service provision has been the main containing factor of a general impoverishment trend, and it prevented the impacts of financial crisis to be worse than they have been. The reasons for welfare systems reform are mainly related to socio-demographic changes, which indeed became the spreading force of new social

risks and needs. These risks now characterize also the lives of the middle-class, especially young people, families and precarious workers [15]. In order to capture the breadth and nature of change, we must direct attention towards developments in the market and in civil society, and especially towards those new forms of collaboration and synergy that have been emerging between these two spheres in welfare provision. The need to go beyond the action of the public sector moves from the idea that the role of the State is increasing and changing, since it has protection and promotion functions for individuals and society's wellbeing, along with the responsibility to unleash the transformative capacity required to fully reach the goal of a more resilient society [10]. According to [16], in the context of complex systems, it is possible to refer to the results of such transformative capacity as social innovation – that is, any initiative, product, process, or program that change basic routines, resource and authority flows, or beliefs of any social system. Therefore, looking at social innovation does not mean studying social entrepreneurship, third sector market or civil society contribution, rather understanding the main features and behaviours of those networks that populate the innovation ecosystems and from which the public sector might take advantage to build transformative capacity. In particular, social innovation might be seen as a welfare reform micro-strategy, structured along different, by nature and intensity, logics of interventions. This strategy cannot be implemented successfully without considering the 'integrated-governance framework' within which such ecosystem is embedded and the policy-orientation it assumes [17].

3 Conceptual Framework

In this paper we build upon the argument presented in [18] where we have adopted the conceptual framework proposed by two of the authors [19] to analyze cases of Information and Communication Technology (ICT)-enabled innovation of Social Protection Systems with a specific focus on resilience. The framework includes a conceptual model based on a typology of innovation attitudes and a stage model of welfare state changes. Table 1 shows at a glance the connection between the different elements of the interpretive framework discussed in this section, that are the welfare state initiatives, the types of resilience, value drivers, networked governance orientation, and type of ICT-enabled innovation [19]. The conceptual model is made up of three key value drivers, *Performance*, *Openness*, and *Inclusion* and their relationship with governance model characteristics, i.e., *State governance system*, *Cultural administrative tradition* and *Socio-economic characteristics* of the context of intervention. The conceptual model also considers the network governance configurations enabled by a given set of digital governance systems, having different impacts on the governance configuration of the stakeholders' networks. Accordingly, at each governance configuration corresponds a type of innovation attitude [19]. Then, the different types of ICT-enabled innovation can be mapped to the different stages of welfare state and the corresponding initiatives for resilience. For instance, in the early stages the emphasis is on the administrative activities and on the absorptive capacity of the public sector employees, with a consequent relevance of performance as efficiency and a technical/incremental type of ICT-enabled innovation. When instead social investment

required by flexibility asks for an adaptive approach to resilience, the focus is shifting to performance as effectiveness and an organizational/sustained type of ICT-enabled innovation.

Table 1. Welfare state initiatives, type of resilience, value drivers, networked governance orientation, and type of ICT-enabled innovation, adapted from [18].

Welfare state initiative	Type of resilience	Value driver	Networked governance orientation	ICT-enabled innovation
Social protection	Absorptive	Performance (efficiency)	Internal governance relationship	Technical/incremental
Social investment	Adaptive	Performance (effectiveness)		Organizational/sustained
Social innovation	Transformative	Openness	External governance relationship	Transformative/disruptive
		Inclusion		Transformative/radical

Yet, the technology development and the consequent societal changes enforce external governance relationships, thus leading to a transformative/disruptive type of ICT-enabled innovation, with the advent of social networks, open government [20], and the progressive digitalization of businesses and society [21]. This paper advances further the analysis of the exploratory research being conducted by the authors on *how* social innovation can foster resilience in a digital governance context. The process of innovation in social policy, as well as the building of resilience implies *changes* in the existing status quo. ICTs can drive and steer such change, while at the same time they can act as counterbalance for the negative consequence of the digital transformation of labour markets on social protection systems. Understanding the logics and principles behind the design and implementation processes of exemplary innovative initiatives is thus crucial from a policy learning perspective, in order to identify the drivers and processes making this change happen and determining its outcomes. Based on an extensive body of literature reviewed, a successful implementation of social innovations in social policy context depends on two general factors – actors, that engage in the innovation process (agency), and the existing institutional landscape of the system (structure). Most research on social innovation focuses on one side only: either on 'agency centred perspective' – an individualistic and behaviourist approach in which social innovation is created through the actions undertaken by specific individuals; or on a 'structuralist perspective' in which social innovation is perceived as determined by the external structural context [22]. Same could be said about research on resilience: its discourse tends to focus either on agency or structure [23].

Nonetheless, based on the principles of the structuration theory [23], we argue that in an ecosystem, various actors are both constrained and enabled by existing structures (especially, in terms of rules and resources), and social innovations are developed in the dialectic relationship of agents and structures. More specifically, agents are empowered by structures both by the knowledge that enables them to mobilize resources, and by

the access to resources that enables them to act [24]. Structure, in turn, is dynamic. Actions of individuals reinforce and/or modify the existing institutions, and by those reinforcements/modifications, future actions are influenced [25]. This is further reinforced by the intermediating role that ICTs play and the networked orientation of governance that they enable [19]. In the following section we apply the framework to four illustrative case studies representing different ICT-enabled social innovations from Belgium, Estonia, Sweden and the United Kingdom (UK) (the cases discussion and analysis are based on [26]).

4 Case Studies

4.1 Employment and Social Inclusion in Belgium: The SMart.Be Project

SMart (*Société Mutuelle d'Artistes*) was born as non-profit organization in Belgium in 1998 to enable artists, and independent workers to tackle the managerial and administrative complexity of the arts sector in the country. With time it broadened its scope to precarious workers in many sectors. Through SMart, these workers who manage their own career paths in direct contact with clients, can access a salaried legal status. The system offers workers the opportunity to build or preserve their social rights by allowing them to obtain the benefits usually reserved for employees, through various services such as information, trainings, legal, advice, subsidies, a social professional network and invoicing tools. SMart, through its online tools, allows freelancers to obtain, for example, access to unemployment benefits, which are usually reserved for employees only. The organization reconciles social protection with a real entrepreneurial dynamic, mainly through its interactive tools. SMart charges a 6.5% fee to cover cost of services and development of mutualized services in Belgium, (although this varies between 6.5% and 8.5% depending on which country the member operates in). Furthermore, the new version of the software currently developed and used by the organization allows also groups of individuals to invoice, whereas before this could be done only at the individual level. SMart also has a training department offering a range of courses on business and entrepreneurial skills. Courses are both generic and sector specific. Smart.Be's target population is equal to the number of self-employed in Belgium, which in 2017 amounted to 591,200 individuals and accounted for 13% of the total employment population. The most common type of self-employment works are: managers (65%), professionals (29%), craft and related trades workers (17%), service and sales workers (14%). At the end of 2016, the company counted on more than 75,000 service users and more than 100,000 different clients. In 2016, 21,244 people used the SMart services for a contract of at least one day. In total, the short-term employee contracts provided via SMart correspond to 595,940 days of declared work, full-time or part-time, which corresponds to 2709 full-time equivalents. In total, between 2012 and 2016, 40,487 people used the company's services, the equivalent of 1/122 of the country's active population. With such results, SMart can be considered as one of the largest employers in Belgium for the creative and cultural sectors. In summary, the company initiative takes a social innovation approach with an absorptive type of resilience, characterized by the presence of fundamental changes in the

relationships between stakeholders. The strength of the ICT-enabled social innovation is strong. Concerning the ICT-enabled innovation, SMart presents a transformative/radical innovation because it substantial uses ICTs outside of the recognized institutional setting and aims to radically modify the existing mechanisms of services provision. Finally, as to the levels of governance SMart can be categorized as having an external orientation moved by openness as value driver.

4.2 Integrated Health and Social Care in Estonia

The Estonian Ministry of Social Welfare, in cooperation with public and private service providers, is implementing a radical re-organisation of how health and social services are provided switching to person-centred service delivery. Estonia is engaged in institutional care reform toward deinstitutionalization, closing old facilities located in remote areas and replacing them with a network of modern, family-living type facilities in populated areas. The objective is to build a network of easily accessible local and regional services. The Special Care Development Plan of 2014, which is part of the Social Welfare Development Plan for 2014–2023, was the first policy strategy document to address deinstitutionalisation and shift towards community-based options. Other reforms support community-based living, including the 2015 Social Welfare Act and labour reform. The Social Welfare Act regulates municipalities' activities and obliges them to provide necessary help and services in order to ensure that people can access services where they live thereby supporting the development of community-based services. These efforts requires a broader ICT development as well as general changes in the health and social services system that affect, in particular, individuals with serious mental illnesses (SMIs). Moreover, existing ICTs that support deinstitutionalisation and community-based care includes the use of digital referrals within the healthcare system and e-consultations between family doctors and psychiatrists to help ensure access to care. Thus, ICT systems play a key role in supporting the functionality of the social care process, which is strictly linked to the eHealth infrastructure and the existence of a shared case management system across services. In this regard, in fact, e-Health has developed faster than ICTs use in social welfare. Estonia began investing heavily in eHealth in 2000 making its online health information system, managed by the Estonia eHealth Foundation, operational in 2008. Since its inception, 95% of health records have been uploaded, e-prescriptions account for 97% of all prescriptions, and 100% of billing is now digital. The system received 500,000 queries by doctors each year. At the same time, the overall sophistication of e-governance in Estonia has contributed to development across sectors. This includes the development of centralized databases (for municipalities and the national government) linked to other databases in order to facilitate policy design and management analytics. However, Estonia's reform efforts in the social services area face two primary challenges: (1) addressing privacy concerns posed by the sharing of consumer information across service systems and (2) creating a financial incentive system for service providers to ensure that consumer outcomes are the primary goal. Privacy concerns exist regardless of whether the sharing takes place in-person or via ICT systems as many persons with SMIs do not want to share sensitive information with all service providers. The use of ICTs compounds the problem by adding digital security issues. In terms of business model, financial incentives via

bonuses for goal attainment are intended to address the costs of growing workloads and turnover losses. However, to achieve these goals, the current financing system needs to be reviewed to ensure that private providers have the incentives to change practices and work with clients in accordance with the person-centred approach. Estonia's health and welfare reform efforts can be positioned between the welfare initiatives oriented toward social innovation and social protection with a transformative type of resilience. The shifts in service delivery philosophy is driven by inclusion as main value with an external network orientation given the goal of avoiding long-term hospitalization while supporting community-based care for persons that have had a psychotic episode as well as more general health concerns. Actually, the reform is posing a great emphasis on the person-centered approach and on the establishment of an open process of co-creation/collaborative innovation networks experimenting pilots with external organization and with the financial help of third institutions. Finally, the overall relevance of ICTs places this initiative as a transformative/disruptive innovation being directed toward a radical re-organization of how health and social services are provided.

4.3 Migrants and Refugees Integration in Sweden: The Mobilearn Project

Mobilearn is a for-profit, self-sustainable micro-company, which assists new migrants and refugees in Sweden to build their CVs and provides help with mapping both their soft and hard skills. It supplies information on what skills and competences are needed on the Swedish labour market, and where, and sends users regular job offers. With regards to housing, Mobilearn complements the government's offer by exploiting the potential of the private housing market and, when possible, suggests accommodation in areas where there is work that matches the individual's competences. Mobilearn also tackles the lack of language skills that affects the migrant's ability to work by offering digital language courses. Additionally, if a migrant cannot read, an audio option can read the information to him/her. If a medical service/assistance is required, Mobilearn helps the newcomer to search for symptoms or find a doctor's address in his/hers native language (it provides services in five different languages: Swedish, English, Arabic, Somali, and Persian). Additionally to these main services offered, Mobilearn assures also secure messaging by providing a message inbox for users and thus a communications channel for customers, along with a selection of news articles, events and other information regarding the host country. Furthermore, it is based on an open data solution and in return it gathers crucial data on end-users.

If migrants are the ultimate end-users, it is the Swedish government, or better yet the Swedish society as a whole, the product's main beneficiary. As of now, Mobilearn has engaged with more than 280 Swedish Municipalities, as well as the Swedish Government, which have already implemented the service as part of their integration/welcoming package, for a total of 40,000 end users engaged. To create the Mobilearn digital solution, its creators contacted the thirteen biggest local Swedish public entities, from healthcare to labor, and required access to all their open government data in order to create the connections to the databases and collect in a single platform all the relevant information provided. This information was then translated in the five biggest migrant languages. Additionally, an advisory board consisting of their

local community, and its authorities, along with a group of end-users, was formed to assist the team in the intervention's establishment. Finally, the Mobilearn group also applied an impact measurement tool called the "Mobilearn model". The model is a 24-month activity plan based on the app clients' different key performance indicators (KPIs). The client commits to follow the plan by distributing, working with and including Mobilearn in their strategy – in order to reach agreed upon goals during the two years. It captures end users' feedback through surveys, and measured the actual usage of the service by looking at statistics and analysing data. One of the immediate results of the intervention is that more than half of all municipalities in Sweden are contracted, resulting in approximately 40,000 migrant users registered, which represents approximately 30% of the migrant population that arrived in Sweden in 2015. Public agencies such as the Swedish Migration Agency, the Swedish Employment Office, the Swedish Tax Authority, the Swedish enterprise agency (Verksamt), and Hermods, the largest private education institute, all use Mobilearn as a communications channel towards migrants.

Mobilearn was fully funded via private equity, raising an initial amount of 1.2 million euro and its business model is based on licensing the app to various clients in the public sector, which are then in charge of providing the service to migrants. Mobilearn can be positioned among the social innovation welfare initiatives and characterized by a transformative type of resilience. Concerning the ICT-enabled innovation, Mobilearn presents an organizational/sustained innovation implying the introduction of new management methods and techniques, new working methods, and new partnerships. Furthermore, the main value drivers are openness and inclusion, considering that Mobilearn, revolutionized the way to leverage open data for public use and immigrants as well as migrants inclusion, by combining different functions (aggregation, search, delivery, translation and partially personalization). Finally, being capable of generating social value by improving information exchanges between different stakeholders, the app implies a external orientation for what concerns networked governance.

4.4 Social Assistance in the UK: The Troubled Families Programme

In 2012 the UK government implemented the Troubled Families Programme (TFP) in an effort to change service delivery and adopt a whole family approach in order to reduce poverty, increase employment and school attendance, reduce juvenile delinquency and criminal offending, as well as reducing reliance on social services and social assistance for multi-problem families in the UK. The unit charged with operating the TFP, established in January 2012, identified the delivery partners (152 top tier local councils due to their contact with families) and set up the guidelines for programme operation within a three-month period. The guidelines do not specify the interventions to be provided, but call for a results-based "whole family" approach according to which councils are paid in two phases: an upfront payment for each family and a final results-based payment for families deemed to have been "turned around" meaning that they met designated outcome criteria. Initial target group estimates were based on Cabinet Office analyses of the Families and Children Study and led to the identification of

120,000 families in England that met five of the following criteria: no parent in the family was in work; the family lived in poor-quality or overcrowded housing; no parent had any qualifications; at least one parent had a long-standing limited illness, disability or infirmity; the family had a low income (below 60% of the median); and the family could not afford a number of items of food and clothing. The 2015–2020 extension of the programme expanded the intervention to include an additional 400,000 families and saw the inclusion of new criteria including: having a child in need of protection, health (physical and mental health) issues, domestic violence, and substance abuse. The TFP model, once implemented, was expected to lead to savings across systems, but this does not necessarily translate into immediate savings or into savings for the service making a given investment in resources. Information sharing, data protection and consent represent ongoing challenges. To address such challenges the development of numerous ICT systems was deemed necessary; this includes improving capacity to identify families, securely storing and sharing data, having easy access to the family plan, progress made and other relevant data, and inputting and tracking results. The most innovative use if ICTs can be seen in technologies to help identify families based on the services' priorities. This entails both the creation of data warehouses to store and link information from across services (including schools) and the use of behavioural analytics to support the adoption of a preventive approach, enabling the identification of families in need of whole family service delivery *before* problems reach a critical point. Computer system suppliers have supported data warehouse development, modifying systems to support TFP needs. As of December 2016, 185,420 eligible families were enrolled in the programme and receiving whole family services. During phase 1, 51% of enrolled families received "intensive" services whereas 11% of families reported receiving no support. Phase 1 statistics indicate that of 117,910 families enrolled, 116,654 or 99% had been "turned around" as of May 2015. Only two authorities (Cornwall and Lancashire) had a "turn around" rate below 90%, while 132 authorities "turned around" 100% of enrolled families. Government data indicate that 43,813 families achieved significant and prolonged progress as of March 2017. Service delivery indicators comprise the level cooperation with other agencies, data sharing, and speed of services (e.g., getting a health diagnosis). TFP can be positioned in the area of welfare initiatives for social protection, characterized by an absorptive type of resilience. The national framework provided by the TFP works to alter service delivery via an innovative shift from an individual model to a whole family model based on integrated care. This shift in service delivery led to the need for innovation or re-thinking of the use of ICT to support more efficient identification of service recipients and subsequent service delivery. Thus, concerning the ICT-enabled innovation, the TFP presents a technical/incremental innovation and the main value drivers are performance (efficiency) and inclusion, implying an external orientation for what concerns networked governance.

5 Conclusion and Future Work

In this paper, we have applied the proposed framework of analysis taking into consideration the variables defined as the most relevant for operationalizing the approach on the agency-centric and structure-centric factors enabling and shaping social innovations and resilience in a digital governance context (see Table 2).

Table 2. Comparison among the considered social innovation initiatives

Initiative	Welfare state initiative	Type of resilience	Value driver	Networked governance orientation	ICT-enabled innovation
Smart.Be (Belgium)	Social innovation	Absorptive	Openness	External	Transformative/ radical
Health and welfare reform (Estonia)	Social innovation/social protection	Transformative	Openness	External	Transformative/ disruptive
Mobilearn (Sweden)	Social innovation	Transformative	Openness/inclusion	External	Organizational/ sustained
Troubled Families Programme (UK)	Social protection	Absorptive	Performance (efficiency)/ inclusion	External	Technical/ incremental

The comparison among the four cases analyzed show different approaches to achieve different levels of change that are appropriate to the challenge addressed and are context-dependent. In particular, by looking at the main variables that are prominent in each case it is possible to operationalize the logics and principles of change, induced by social innovations to foster resilience. For instance, the case of TFP in the UK, shows that in the early stages of a public sector led intervention, the emphasis is on the administrative activities and on the absorptive capacity of the public sector employees, with a consequent relevance of performance as efficiency and a technical/incremental type of ICT-enabled innovation. The case of Smart.be in Belgium instead, though keeping an absorptive capacity to 'build the case' for a new way of social protection for precarious workers, has a transformative/radical ICT-enabled innovation type building on openness. Openness is also the main driver for the Estonian case, where, however, the transformative type of resilience is enabled by a disruptive ICT-enabled innovation potential, that addresses the challenge of integrating health and social care systems. Finally, Mobilearn in Sweden, results in a transformative type of resilience produced by an organizational/sustained type of ICT-enabled innovation driven by openness and inclusion principles and orientation. It is exactly the external orientation of the networked governance systems that represent, in all cases, the added value generated by the combination of social innovation and digital technologies to foster resilience in the local ecosystems in which the initiatives have been designed and contextualized. It is in fact the adaptation and adoption of technology to the local context (enabled by a co-design and co-development approach) that is a critical aspect of initiatives that have a core social investment perspective: this requires flexibility and the adoption of the adaptive approach to resilience. The framework

proposed is designed to be applied in the analysis of individual social innovation initiatives (e.g. process tracing, contribution analysis) to understand their potential of fostering system resilience. It also allows comparing individual initiatives one to another in terms of their likely contribution to resilience. It does not, however, take into account how several separate innovations may interact within a single system. For example, transformative change within a system may result from an incremental impact of several niche innovations [27]. Such developments would require additional elements to the presented approach and will be addressed in future research. In doing so future research shall look at how the framework could capture and assess to what extent the objectives of a social innovation initiative were achieved, looking into how the actually achieved outcomes relate to the resilience capacities of the system. In addition a further development of the framework shall also help researchers and policy makers to guide the case selection for the empirical analysis. This would require identifying a number of additional variables that may be applied to achieve the maximum variation of case selection, which would allow not only validating this framework in different contexts, but also raising additional hypotheses and unveiling new relationships.

Disclaimer. The views expressed in this paper are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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Correction to: Understanding the Social Implications of the Digital Transformation: Insights from Four Case Studies on the Role of Social Innovation to Foster Resilience of Society

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The original version of the paper starting on p. 145 was revised. The last sentence of the abstract part on p. 145 was incorrect. Instead of "Based on an extensive body of literature reviewed the framework proposed for interpreting the effects of social innovation in fostering resilience fare discussed through four case studies" it should be read as "Based on an extensive body of literature reviewed, the framework proposed for interpreting the effects of social innovation in fostering resilience and its application are discussed through four case studies."

The original chapter was corrected.

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