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Welcome to the new issue of JeDEM!

This second part of JeDEM Vol. 12 comprises the ongoing papers submitted to our platinum open access journal during the second half of 2020 that made it through our double-blind review process. (Have you ever wondered why we define ourselves as platinum? Then we recommend this article titled <u>"Noble metals for a noble cause"</u> by Jean-Sébastien Caux).

But before we dive into the content, let us tell you a bit about what else we have been up to. This year, the thematic trends in JeDEM and the motivation of its users to publish open access has been the topic of two research outputs of the editors. One is based on a survey we did within the JeDEM community, and one based on data-mining of journal content in order to derive topical trends and insights for journal editors. If you are interested in the outcome, please check out the links below!

Additionally, we are now a member of OASPA (the <u>Open Access Scholarly Publishers</u> <u>Association</u>), and have been working together with our chief editor Anneke Zuiderwijk to improve the vision of the journal. As always, open data and co-creation will stay a big thematic focus – by all means check out our current <u>call for papers</u> if you are working on related projects.

In line with our thematic focus of JeDEM throughout the years, this issue stays true to one of our most covered topics: e-participaton and digital transformation.

The article by *S. De Paoli* and *P. Forbes* offers a conceptual analysis and a case study research on the design of e-Participation in environmental policy-making for young people. *Connecting environmental action to e-participation* research is something worthwhile and highly relevant these times, we find, and indeed the paper confirms that environmental action can increase e-participation capacity in environmental policy-making for young people. After reading this article, you will know about the core dimensions of environmental action for young people defined, but also how it is possible to seamlessly connect political communication, social theory and technology in environmental e-participation. Furthermore, the paper offers some practical recommendations for the design and conduction of e-participation.

The article by *C. Abusleme* focuses on nothing more than *Cracking the Political Code* – precisely the one of *E-participation in Colombia*. This work focuses on the nation-wide project Urna de Cristal and analyses three criteria: Inclusion, participation and deliberation. Importantly, the evidence suggests

that the enactment of the project reflected the government's intention of preventing the policy process from becoming more participatory and deliberative. However, some data also suggests that the government tried to render this process more inclusive. This shows once more that technology enactment in the public sector is always tied to political complexity, and that ICTs capability of provoking change is always tied to a variety of political, cultural, organizational and budgetary factors. We can also recommend this article if you want to find out why the study of e-participation remains politically biased, or for a critical review of the existing e-participation literature (and the technodeterministic perspective that is often emphasised in this context).

With the next article by *M. Chatwin* we learn about the nascent movement that is the *Civic Tech Ecosystem*, and how it can be improved with view to *Monitoring and Evaluation*. Highlighting several challenges, the paper suggests that a theory-based evaluation approach is able to contribute to the growth and sustainability of the movement. This paper applies the early steps of contribution analysis to two distinct Canadian civic tech projects to demonstrate its feasibility for civic tech. The first is a fellowship program from Code for Canada aimed at accelerating digital transformation within government, the second BetaCity YEG, a community civic tech group in Edmonton highlighting a grassroots approach.

Finally, the article by A. Windarti titled in the form of the question *Is Accessibility of Internet Financial Reporting Evolving Towards More Compliance of Disclosure?* deals with the crucial community demand of financial transparency. Transparency is an expansive idea which is identified with the accessibility of data (the supply side of transparency). The author analyses the effect of financial performance on compliance in the context of internet financial reporting (IFR) through e-government. Based on case studies from provincial governments throughout Indonesia, this study provides empirical data about the relevance of IFR accessibility.

All papers published with JeDEM are also listed with Scopus. Furthermore, they are aggregated with CORE, one of the world's largest collections of open access research papers, offering authors several options for disseminating their work.

Last but not least: If you want to become a reviewer for a journal, please do not hesitate to register by creating a user account on our website. Don't forget to specify your reviewing interests (the more we know about them, the better (2)), and that your efforts can be recorded with <u>ReviewerCred-its.com</u> if you register. If you do not know this tool yet – we very much recommend checking out their website, instructions, free training and how-to!

We strive to improve our already rapid publishing process in the future, but if you have any feedback or suggestions, we are always happy to hear from you!

Enjoy reading the last issue of the year, and see you on the other side, in 2021! Until then, stay safe.

Links:

- Check out our presentation related to JeDEM at the <u>Munin Conference</u> a joint project of Gdansk University of Technology, Danube University Krems and Delft University of Technology. The Munin Conference is an annual conference on scholarly publishing and communication, primarily revolving around open access, open data and open science.
- We have published a paper on JeDEM as a case study in the journal *Publications*. If you want to know more about the motivations to publish open access of our community, this is for you: <u>Open Access Perceptions</u>, Strategies, and Digital Literacies: A Case Study of a <u>Scholarly-led Jornal</u>
- Check out our Special Issue CFP on <u>Co-creation and Participation Fueled by Open Data:</u> <u>Evidence and Impact</u>
- <u>ReviewerCredits.com</u>: Instructions, free training and how-to for reviewers
- Worth a read: <u>"Noble metals for a noble cause"</u> by Jean-Sébastien Caux, founder of <u>SciPost.org</u>

About the Editors

Noella Edelmann completed her Psychology Degree at the University of Strathclyde, UK and Masters' Degrees at the University of London, UK and the Danube University Krems, Austria. She received her PhD from the Tallinn University of Technology, Estonia where she focused on the importance of online lurking in the context of e-participation. Currently she is a senior researcher at the Department for Governance and Administration at the Danube University Krems. Her main research interests are the digital transformation and the use of social media in the public sector, e-participation, Open Access and scholarly communication. She is involved in the EU-funded projects such as the H2020 Inclusive Governance Models and ICT Tools for Integrated Public Service Co-Creation and Provision, and national projects funded by the Lower Austrian Regional Government, the Austrian Ministry of Digital and Economic Affairs (BMDW) and the Ministry of Civil Service and Sport. Noella is the Managing Editor of the international Open Access eJournal for E- Democracy and Open Government (JeDEM), Chair of the Social Media Track at the EGOV-CeDEM-ePart Conference and a member of IFIP WG 8.5 and OASPA.

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Connecting Environmental Action to E-participation Design for Young People

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The paper offers a conceptual analysis and a case study research on the design of e-participation in environmental policy-making for young people. This is achieved by connecting the concept of environmental action with e-participation design. Through a literature review, four core dimensions of environmental action for young people are identified: ownership, participation, stakes in the future and experience. Through a case study of research conducted for an applied project aimed at designing and piloting a novel e-participation solution, the paper shows how young people, implicitly see the connections between these four dimensions of environmental action and the e-participation process. The dimensions of environmental action have then been used as the basis for co-creation activities and for a subsequent evaluation of e-participation. The results support the position that environmental action can underpin the design and can increase e-participation capacity in environmental policy-making for young people.

Keywords: e-participation, environmental action, trust, experience, young people, future

1. Introduction

This paper's main contribution to research and practice¹ will be to show how the concept of environmental action can underpin the design of an e-participation platform prototype supporting young people's involvement in environmental policy-making. The concept of environmental action points to the capacity of individuals and groups to take deliberate and proactive decisions in order

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to achieve a desired environmental outcome (Emmons, 1997, Schusler et al., 2009). e-participation has been defined by Sæbø et al., 2008 (p. 400) as "the extension and transformation of participation in societal democratic and consultative processes mediated by information and communication technologies (ICT), primarily the Internet".

This work is the outcome of a European research project, aimed at designing and piloting a novel web and mobile e-participation prototype platform for Young European Adults (YEAs) aged between 16 and 29. The project was funded by the European Commission under the auspices of the EU Youth Strategy (2010-2018) (European Commission, 2018) aiming at encouraging young people to be active citizens and participate in society. As such this e-participation project was not concerned with the general public or stakeholder engagement practices and focused specifically on Young European Adults. The goal of the project was to create a platform allowing YEAs to collaborate with Policy-Makers (PMs) in the area of environmental policy-making. More details about how the project tried to tackle issues around the societal and political engagement of young people toward environmental issues can be read in the work by Vogiatzi et al. (2017). This paper instead will show specifically, using the project as a case study, how the concept of environmental action can be used as the basis for e-participation design and how this can lead to good engagement of young people in environmental policy-making.

Citizen engagement with public policy is an established concept in research and practice. However very often the traditional means of participation, for example public hearings and citizen panels, have been criticized as time- and money-consuming and low in efficiency (Zheng, 2017). The location and timing of these types of events is usually fixed and often inconvenient, for example when people are at work and the location may be hard to travel to for some and would incur a cost. There is agreement that we face a context of decline in public participation (Putnam, 2001) and often the use of Information and Communication Technologies (ICTs) is a means to increase public engagement by opening up direct channels of communication between policy-makers and the wider public. e-participation could help overcome the shortcomings of more traditional approaches and also offer citizens much more choice for action and decision making (Phang & Kankanhalli, 2008). However, our current understanding of successful e-participation strategies and implementation is still very limited (Wirtz, Daiser, & Binkowska, 2018). It is now accepted that just building platforms for e-participation is not enough and research has argued that the "build it and they will come approach" often does not suffice to counteract the public participation decline (Tonn, 2004). For example, some of the biggest challenges for e-participation processes (especially in the European context) are the citizens' lack of trust toward political institutions (Lironi, 2016) and the difficulties in articulating clear connections between participation and institutional legitimacy (Dalakiouridou et al., 2012). The lack of trust especially affects young people, where research has shown that the more traditional channels of representative democracy (like voting) only partially stimulate their active participation to political life (European Commission, 2013). Consequently, strategies have been developed in order to increase young people's interest toward political participation (European Commission, 2018) including the use of ICTs. Indeed, in e-participation research literature, there is substantial agreement that citizen engagement and participation can have a positive effect on citizen's trust in government (Cooper et al. 2006), which can also substantially improve governmental responsiveness toward public concerns (Buček, 2000), increase governmental legitimacy (Fung, 2006)

and augment policy-making capacities (Percy-Smith and Burns, 2013). Research has also shown that public authorities venturing into e-participation may also gain from being seen as innovators by citizens (Mergel, 2015). Moreover, research showed that e-participation solutions have the capacity to enhance young people's education toward the democratic decision-making process (Macintosh et al. 2004) and online activities do have an influence on young people's offline political participation (Quintelier and Vissers, 2008).

Extensive research has also investigated the impact of social media and social networking sites such as Facebook on young people's social capital and civic engagement (Brandtzæg, Følstad, & Mainsah, 2012; Xenos, Vromen, & Loader, 2014; Mavrodieva, et al., 2019; Omotayo & Folorunso, 2020). For example, Boulianne et al.(2020, p. 209) state that "social media can be used to question, contest, and/or support decisions or actions of media, political, private or governmental organizations". Their research relates to the recent strikes for the climate crisis and reflects a trend in international protest events, which are connected through social media and other digital media tools. Omotayo and Folorunso (2020, p. 148) in a case study in Nigeria showed that youth can use social media for a large variety of activities in the area of political participation involving among others "political advocacy, political campaign, communicating with politicians, political discussions, monitoring and reporting electoral malpractices, public consultations, joining interest groups that engage in lobbying, blogging about political issues and writing letters to public officials.". It is also notable that our research took place prior to the massive environmental awareness campaign begun by Swedish teenager Greta Thunberg. In the past 2 years there has been a huge increase in youth activism relating to the environment and this clearly also took place on social media where research has detected a change in sentiment toward the importance of the environment and has shown that social media played a role in amplifying this message (Jung et al., 2020)

Promoting public participation is a fundamental principle in European environmental law, whereby the Aarhus Convention gives the public the right to obtain information on environmental issues and participate in the related decision-making. Responding to this fundamental principle the STEP project conducted research, in order to design, develop and pilot a novel e-participation platform for YEAs engagement in environmental decision/policy-making. It is important then to remark that the projects main goal was thus not conducting e-participation per se, but designing and testing a novel platform prototype in five municipalities and regions in four countries (Italy, Turkey, Greece and Spain). In addition to these public authorities, the project team was composed of several other organistions including a university, a research centre, a youth environmental NGO and a number of SMEs. It is important to note that one of the overall goals of the project was to create a platform that the SMEs involved in the project could then later on use for their own businesses activities, especially in the areas of promotion of environmental activities and public participation. Within the project, our group was specifically tasked with conducting social research supporting the technical partners, focusing on: (1) understanding the needs and obstacles for designing an e-participation platform for environmental policy-making, supporting YEAs and PMs; (2) conducting research to convey these needs and obstacles to the design and development teams; (3) evaluating the platform's capacity of supporting the involvement of YEAs during the piloting.

In conducting this research, we took environmental action as the guiding concept. Consequently, the main question that this paper will seek to answer is: how can we practically connect environmental action to the design of an e-participation platform prototype for supporting young people's engagement with environmental policy-making?

2. Environmental Attitude, Behaviour and Action

In this section, we will discuss different concepts from the literature that can help understand the relationship of young people and young adults with the environment. As an outcome of this literature review, we will propose that the concept of environmental action can support the design of e-participation solutions for young people for environmental decision-making.

A first key conceptual distinction we need to focus on is that between environmental attitude and action. An attitude is a predisposition - positive or negative - toward specific values, people or ideas (Eagly and Chaiken, 1993). Environmental attitudes develop over time and are dependent upon demographics and social factors (Dietz et al., 1998). Social factors include aspects such as socialisation, social norms or communication processes. Research has shown that in particular socialisation may drive positive environmental attitudes especially influenced by the family, formal education and peers (de Vreede et al. 2014; Grønhøj and Thøgersen, 2009). The media (including online) can also offer a basis for pro-environmental socialization (Östman, 2014; European Commission, 16). Demographic factors are instead structural elements of society and include aspects such as age, social class, residence (urban/rural), political orientation and sex/gender (Van Liere and Dunlap, 1980). The assumption made by proponents of the concept is that variations in demographic factors have a causal influence toward positive or negative environmental attitudes. However, research has produced contrasting results. For example, one research paper has shown that females seem more concerned than males about the environment e.g. (Zelezny, 2000). Another contribution however, has shown little difference between the environmental attitudes of males and females (Tindall et al. 2003). Environmental concern has also been positively associated with income or occupational prestige (Van Liere and Dunlap, 1980). However, other research (Wilson and Snell, 2010) has shown that people with limited material resources are particularly affected by environmental problems and may consequently have a significant level of engagement.

In designing environmental e-participation for YEAs, we suggest that leveraging on the notion of attitude will have limits. An e-participation design is unlikely, in the short term (such as the timeframe of a single research project), to have the ability to influence social factors (e.g. increase participants' education levels), although this may be possible over a longer period of time, and has no capacity to influence demographic factors. Moreover, discriminating among participants on the basis of, for example, their education or income is not commendable. Rather than focusing on attitudes, we suggest that a better approach for the design of environmental e-participation for YEAs is to focus on supporting environmental action. That of social action is a fundamental concept in social sciences and captures the idea that an agent intentionally orients his/her doing toward specific ends or values, while taking in account other actors (Weber, 1922). In line with this, environmental action

was defined by Emmons (1997, p.35) as "a deliberate strategy that involves decisions, planning, implementation, and reflection by an individual or a group. The action is also intended to achieve a specific positive environmental outcome, either small or large".

An additional important distinction we need to focus on is that between environmental behaviour and action. In both cases, the actors may be doing something leading to a positive environmental outcome, which would suit active e-participation, but there is a fundamental difference. While pro-environmental behaviour is likely habitual, actions require intention (de Vreede et al., 2014) and are oriented toward tackling the causes of environmental issues. Changes in behaviour (e.g. ensuring people use public transport rather than the car) can be triggered by positive or negative reinforcements (e.g. increasing costs for parking or reducing public transport fares), but this does not mean that the actor is aware of the root-causes of environmental issues or that she is intentionally intervening on these causes. We suggest further that the notion of environmental behaviour also cannot support the design of e-participation, since actively participating in policy-making requires intentionality and pro-activity from participants. We can understand this more clearly by considering the concept of action competence (Jensen and Schnack, 1997; Breiting and Morgensen, 1999). This concept is a critique to environmental educational approaches that focus on triggering changes of behaviour rather than on stimulating intentions to tackle causes of environmental issues. Action competence also criticizes individualistic approaches and emphasizes participatory processes. According to Jensen and Schnack (1997, p. 165) "'Competence' is associated with being able, and willing, to be a qualified participant". This is in line with a definition of environmental action by Schusler et al. (2009, p. 122) as "a process of co-creating environmental and social change that builds individuals' capabilities for further participation contributing to personal and community transformation". These definitions contain strategic aspects and we have identified four relevant dimensions of environmental action and action competence in literature (also summarized in Table 1), that can constitute the basis for environmental e-participation design:

- 1) Youth ownership and empowerment: this includes aspects such as the young people seen as agents of change (de Vreede et al., 2014) and the availability of spaces where young people can take ownership of their actions. Indeed, as Percy-Smith and Burns (2013, p. 336) articulated: "Central to promoting the increasing role of young people as agents of change in communities is the provision of spaces which are not always controlled by adults or defined by the adult agenda but which also provide opportunities for young people to take action in response to issues they feel passionate about".
- 2) Participation: research on environmental action (e.g. see definition above by (Schusler et al. 2009) has emphasised the importance of peer participation and co-creation with actions conducted via participatory and democratic mechanisms, where individuals join forces and bring their capacity to contribute to socio-environmental transformations.
- 3) *Stakes in the future:* a key motivation for environmental action is the need to protect the environment for future generations (Ballantyne, 1995). According to de Vreede et al. (2014, p. 37) "Committed and action-competent young people provide a valuable force, which can influence change as they have a great investment in future quality of life and can approach problems with a fresh, optimistic view".
- 4) *The experiential component*: environmental action is not related to abstract environmental principles but rather with young people's direct and own experience de Vreede et al. (2014, p. 37;

Bögeholz, 2006). This means that the issues that mean most to them are the ones that have a direct impact on their lives.

Table 1: Concepts and their potential connection with environmental e-participation design

Concept	Usable in the design of e-participation on environmental issues?
Environmental Attitude	Does not involve taking a proactive stance. Attitudes develop over time and are unlikely to be influenced by an e-participa- tion design process alone.
Environmental Behaviour	Does involve "doing something" habitually, but does not re- quire intention. Does not help in e-participation where young people should engage to tackle causes and concerns of envi- ronmental problems.
Environmental Action	Can support e-participation design, as the focus is on young people willing to achieve pro-environmental outcomes by working together on things that matter directly to them.

3. The STEP Project

In this section, we briefly introduce the STEP² European project upon which this research paper is based and which is used as a case study to show how to connect environmental action and environmental e-participation design. During the project, five pilots were conducted in four countries for testing the prototype: Italy, Spain, Greece and Turkey, with the participation of one regional authority, three municipalities, and an association of municipalities. The piloting involved nearly seven thousand YEAs and ninety-one PMs, over two and a half years, producing eighty-eight dialogues. Our role within the project was supporting the technical team in understanding the needs of YEAs and PMs in relation to the platform design and piloting.

The project's main goal was to develop and pilot test a cloud e-participation platform supporting environmental policy-making and deliver a near to market solution. The STEP platform consists of four main cloud based components, which are: 1) the e-participation component, 2) the social media mining and visualization component, allowing the integration and use of resources for e-participation with the wider social media environment, 3) a machine translation and text to speech component supporting multilingualism and 4) the data logging components managing the platform's data. The cloud solution allows for the seamless integration of these components which were developed by different project partners using different technologies. More details about the technical aspects of the cloud based solution are available in this project deliverable by Yümlü et al. (2016). The e-participation component is the core of the platform, supporting the interaction between YEAs and PMs in the respective local authorities and supporting the communication of/with the other components of the platform. The e-participation component includes all the end-users interfaces. This

² For further details consult the project website http://step4youth.eu/

component was not created from scratch but was based on a previous existing collaborative platform belonging to one of the project partners and called co:tunity (https://www.cotunity.com/).

The platform supports both top-down and bottom up approaches to e-participation (Vogiatzi et al. 2017). During the project's initial phases a set of use-cases (named "dialogues") were defined by the project team with the active collaboration of the local authorities, for piloting the platform prototype. The top-down dialogues can be initiated by PMs and include Consultation, Consultation on Environmental Impact Assessments (CEIA) or Round Table discussions. The platform also allows for bottom-up dialogues, these can be initiated by YEAs and include Call for petitions and Call for ideas. These use-cases were identified through the definition of a framework for public participation created by combining information from available best practice guidelines and toolkits and adapting it to the STEP project specificities (Vogiatzi et al., 2017). Choices around the use-cases and the piloting activities for the platforms were then taken, under the umbrella of this framework, together with the public auhtorities involved in the project and based on their knowledge of the specific issues that would matter for their youth. Moreover, the choice of the content of the initial dialogues to be conducted through the platform was informed by carrying out a 'Cultural Probe' study, lasting for four weeks. Cultural probes are studies that include open-ended and evocative activities for participants to pursue in their own time to help narrate their lives to technology designers. Using an early prototype of the platform we involved an initial small number of young people (n=16) in a digital cultural probe requiring posting content responding to specific prompts coming from the researchers. Results of this probe allowed us to indentify what should be the initial focus for the STEP dialogues with the following areas emerging as relevant for YEAs: sustainable transport, food and reducing waste / recycling. Moreover the probe confirmed the importance for YEAs to receive timely feedback on their inputs, the importance of nurturing youth leadership in public participation via the platform and the importance of favouring a collective mentality based on that idea that YEAs by working together could make a difference for the environment. The results of the probe study can be consulted in the paper by Forbes and De Paoli (2016).

The regular use of the platform from the YEAs perspective is as follows. Once YEAs sign up to the platform they can view all the available dialogues for their municipality/region/local area and can participate in them. The most commonly used dialogue during the piloting activities was for local PMs to open up a consultation on a specific issue (e.g. management of environmental resources in the area) to obtain YEAs' ideas (for example, on protecting Sea Turtles in Greece or for an urban garden in Spain). In a consultation, the environmental issue is presented by PMs with supporting material (images, files, videos, etc.) and a specific question is posed to participating YEAs (e.g. what should the authority do for protecting our Sea Turtles?). YEAs are then invited to contribute via a variety of options, including multiple choices, yes-no questions, open free-texts and comments. The consultation remains open for a period of time and the inputs are visible to all participants. At the end, the results of the consultation are analysed and a report on which actions will be taken by PMs is published in the platform. The bottom up dialogue, Call for ideas, was also used during the pilots. In this case PMs ask to YEAs to propose ideas, for example, for redeveloping a chosen area in a Spanish municipality where the remit of the public authority was specified in advance, for example a budget of 100,000 Euros. YEAs can then vote for the proposed ideas and PMs make a clear commitment to consider those ideas which have received a minimum number of votes.

4. Methods and Materials

It is widely accepted in design research that end-users can be a rich source of product and service innovations (Prahalad and Ramaswamy, 2000) and that their involvement in the initial phases of design can better support the uptake of new ICT solutions. Although, during the project, we also worked with PMs, in this paper we concentrate mostly on YEAs, as they were the core target users. The main rationale underpinning our research method for researching the end-user needs was that of connecting the concept of environmental action previously described with a user-centered design of the platform. We worked toward ensuring that the four core dimensions of the concept of environmental action could be translated in the prototype e-participation platform under the assumption that this would better support environmental participation from YEAs. Our empirical research, which saw a continuous and active involvement of YEAs and PMs over two years and a half, was organized in three main phases (Fig. 1): (1) early interviewing with YEAs and PMs to gather their environmental action needs and the deployment of a cultural probe with YEAs, using a prototype of the platform as described earlier (Forbes & De Paoli, 2016); (2) building personas reflecting environmental action needs of the users and co-creation with participants, by transforming some of the personas' needs into concrete design ideas; (3) a final evaluation of whether participants environmental action needs were met by the platform during the piloting. Additionally, as the platform needed to fulfill the needs of all end-users across different pilots (and Europe more widely), we concentrated on their common needs rather than on specific national or regional differences.



Fig. 1. Social research phases of the project

The goal of interviewing YEAs early in the project was important to understand how the platform's features could facilitate their environmental action. As part of the initial research phase, we interviewed 28 YEAs from 9 EU Countries (thus including YEAs from beyond the piloting areas in United Kingdom, Germany, France, Hungary, Romania and Latvia). We used a purposive sampling, with participants identified by the project partners.

Subsequently, findings from the interviews were used for the creation of personas and scenarios. Personas are "user archetypes" that help developers take decisions about design solutions by adopting a user-centered perspective. Personas are models of real users whose traits "are identified through the analysis of interview data" (Cooper et al. 2007, p. 82). Scenarios are narratives of the personas interacting with the future product or service. It is through personas and scenarios that our findings on the end-users' environmental action needs were passed to the technical partners of the

project. Later in the paper, we will concentrate mainly on the personas creation and on the connection between our interviews findings on YEAs environmental action and the creation of personas for environmental e-participation.

We then conducted co-creation workshops (listed in Table 2) mostly with YEAs and also some with PMs, with one session including both groups. The purpose of the co-creation was to bring the environmental action needs of end-users, as mediated by the Personas, within the design process, so that these needs could translate into initial design ideas. We began by carrying out workshops early in the project and continuing throughout the middle stages. Results have been fed back to developers to enable the co-created solutions to be considered and when possible (thus not always, due to some limits imposed by the pre-existing technologies used by the project) incorporated into the testing platform.

Two simple exercises were used during the core set of workshops with YEAs (workshops 2 to 6), with the goal to generate a wide range of ideas for furthering the needs of personas. Later we will present results mainly from these core workshops. By working in small groups:

- YEAs were invited to co-design the platform's features for the personas. Each group's best idea was then presented by a spokesperson and discussed with all participants.
- YEAs were assigned one of the personas and asked to sketch ideas for an interface that this persona would find appealing.

In additional co-creation workshops (1, 7 and 8) specific elements of the platform and of the interaction between PMs and YEAs were explored: for example workshop 1 focused on exploring how to make the platform fun and engaging for young people; workshop 7 focused on the issue of trust (or the lack thereof) between YEAs and PMs, where we used card-sort exercises to prioritise the importance of various elements contributing to increasing trust between the two groups. In the final workshop (8) we worked with a group of young people from a disadvantaged background to ensure that the needs of this 'hard to reach' group were also considered.

Workshop Nr.	Country	Participants	Focus
1	UK	33 YEAs	Engage- ment/Fun
2	Spain (1)	21 PMs	Ensuring Ele- ments for Services match
3	Czech Republic	7 YEAs	General Design Elements
4	Spain (2)	12 YEAs	Personalisation Elements
5	Turkey	21 YEAs	Personalisation Elements
6	Italy	15 YEAs	Interactions
7	Greece	20 Mix YEAs /PMs	Issues of Trust
8	UK	8 YEAs (from a disadvantaged background)	Explore current Design elements

Table 2.	Co-creation	workshops	on Users	needs
1 1010 2.	Co creation	workshops	on abero	neens

In the third phase of the research, a combination of qualitative and quantitative techniques was used to evaluate whether the environmental action needs of end-users were met by the piloting eparticipation platform. We adopted a self-completion, online questionnaire (n=181 YEAs). The questionnaire included mostly Likert scales (Strongly Agree, Agree, Neither, Disagree, Strongly Disagree), in order to collect evidence on the achievements of the project goals, environmental action needs satisfaction and future use of the platform. We had a balanced distribution among female (47%) and male (52.5%³) respondents. As part of the evaluation, we also conducted qualitative interviews, (with a purposive sample of 12 YEAs and 9 PMs who participated to the piloting) in order to have more in-depth evaluation evidence. Later on, we will also present interview excerpts from PMs, as there are interesting observations to make. The interview protocols and the questionnaire can be consulted in the project reports (De Paoli & Forbes, 2015; Forbes & De Paoli, 2017).

For the questionnaire data, we produced descriptive statistics showing aggregate results of the evaluation. All the qualitative interviews were analysed using Thematic Analysis (Braun and Clarke, 2006). The four dimensions of environmental action were assumed initially as the core themes for the analysis. Moreover, we took a phenomenological angle in our thematic analysis seeking to describe the range in which quite different people (YEAs from different countries) can experience the

³ The missing 0.5% refers to "other" genders

same phenomenon (environmental action and e-participation) and identify the common components that are responsible for that range. We have provided an overview of this analysis method in a separate paper (Wilson et al., 2018).

5. User Needs Research

5.1. Participation theme and trust

We have seen earlier in the literature that a relevant dimension of environmental action is participation. First, we need to note that in an environmental e-participation project, the participation is not just that taking place among peers (YEAs) but it requires YEAs participating together with PMs. From the analysis of interviews, it emerged clearly that there are issues of trust between these two groups. This is in line with previous literature findings, mentioned in the introduction of the paper, about the lack of trust that the public has toward politics, but there are further observations relating specifically to e-participation. From our interviews, it emerged that YEAs felt that PMs could use the e-participation for their own political interests, rather than for seeking a genuine input to environmental policy-making:

...politicians don't give us much of their time, they are thinking of their own opportunity not about Young People. This is the first obstacle, they think first about their own situation and then the situation of the rest of the world [YEA3].

Some YEAs further argued that PMs may not take grassroots initiatives seriously:

I have seen petitions that I have been involved in then get discussed in parliament, but often there are only about 10 people in parliament, they are never discussed at peak times. It's an illusion of democracy [YEA5]

Moreover, interviewees made clear that participation also relates to the expectations that YEAs have toward an e-participation project:

Young People are motivated when they see that the things they are doing have a consequence, a result. If they see that changes happen then they will be interested and motivated. [YEA2]

These excerpts clearly show that from the YEAs perspective their sustained participation requires that their contributions are taken seriously by PMs and are transformed into concrete outcomes. This can possibly help with reducing the identified trust gap and YEAs engagement would be easier to achieve. Inaction from PMs, following e-participation, can instead only reduce the level of YEAs engagement and their trust toward politics.

5.2. Stakes in the future theme

A second fundamental dimension of environmental action is young people's interest toward the future. YEAs we interviewed clearly felt that they have more stakes in the future (due to them having a longer time horizon) than older generations and because of this, they saw themselves as actors that

could take an active role in environmental e-participation. YEAs perceived significant differences between themselves and "older people" toward environmental issues:

There is a generational difference, I think my age group whole heartedly buy into environmental issues [...] whereas my dad's generation are [sic] less concerned. [YEA5]

From the interviews it also emerged that YEAs may have a direct interest in influencing environmental policy-making as this could have a long-standing impact on their lives, also in a rather idealistic sense:

We are a generation in transition, we are the ones making changes for future generations [YEA18]

Young People could create relationships with each other and share ideas on environmental issues. These are important in saving our future. [YEA3]

Some YEAs remarked that although the public should have an interest in the environmental future, there is much short-term thinking:

I don't see much of a clear conscience nowadays, people and politicians think more in the shortterm. Policies need to be for the long-term [YEA10]

I am quite pessimistic about the future of the environment. I believe people should be more concerned about it [YEA7]

It is clear from these excerpts the potential overlap between environmental action and e-participation, where YEAs have an interest in shaping policies if the goal is achieving positive long-term environmental improvements. YEAs however have a pessimistic view of the future but they acknowledge they have responsibilities toward future generations.

5.3. Ownership theme

What was just discussed about stakes in the future, connects directly with a further dimension of environmental action, that of young people's ownership toward environmental issues. YEAs that we interviewed felt they could be agents of change, influence others and work together:

I think it is important for young people to be engaged, we have a voice and we should describe what we are thinking about issues. [YEA9]

It's hard to influence with a single vote but with young people if you can get a lot of young people on your side. It is a large number of the population. It can influence sort of further issues. [YEA12]

YEAs also signaled some obstacles to their ownership toward environmental policy-making. Some argued that, , purposeful ideas promoted by YEAs are often not taken seriously by PMs:

Sometimes I think policy makers should help more. Sometimes the good ideas from young people they are cut off [YEA6]

Thus, while YEAs ownership would be an important component of a potential e-participation, there also are obstacles, associated with participating together with PMs. Clearly, a novel e-participation design would need to take in account this problem.

Finally, ownership of environmental action also relates to dedicated spaces in which YEAs can do things together, using their competencies. YEAs we interviewed saw this potential in an e-participation platform:

The platform should educate and inform as well as providing an opportunity for discussion and campaigning [YEA21]

At least the people sharing their opinion on the platform will feel that they are able to make their voice heard [YEA9]

Thus from the interviews, it was clear that for YEAs, an e-participation platform may offer a space where YEAs can be agents of change influencing environmental decision-making.

5.4. Experience theme

A final dimension of environmental action we considered relates to things upon which young people feel they have an interest in and can have an impact on, in other words with their direct experience. In the words of one of the interviewees:

To facilitate discussion of Young People it's important to create a young discussion [....] something that is of interest to them [YEA3]

A number of interviewees stated they would be mainly interested in e-participation related to the local environment and to small manageable environmental things:

To get people interested you have to make things relative to their lives, for example if you don't do something about an environmental issue then it will have an impact on your life [YEA5]

'low-level' projects would be good to start with, start small and simple. With bigger things many people feel that they do not have enough knowledge to contribute [YEA21]

Some interviewees recognised also that global change could only take place via local change:

Global is more important, but the way to achieve this is through local action and local groups. If everyone works together and takes it bit by bit, rather than starting for a massive global scale then we might be able to do it [YEA12]

YEAs declared clearly that they were willing to engage and act on small things of their direct interest, which are close to their daily experience: focusing e-participation on local environmental issues rather than on global problems was seen as the right approach to support their participation.

5.5. First summary and personas

Table 3 summarises the dimensions of environmental action and their connections to e-participation needs that emerged from our early interviews with YEAs.

Table 3: Environmental action and e-participation needs

Dimensions of Environmental Action	Environmental Action and e-participation: expectations and needs from YEAs
Experience	YEAs are interested in doing e-participation on local environmental matters, of direct in- terest to them, where they can see concrete results. YEAs have less interest to do e-par- ticipation on global environmental issues.
Stakes in the Future	YEAs recognise they have more at stake, and are keen to do e-participation to change things for the future. YEAs perceive their in- volvement as important to achieve change.
Participation	While seen as important, YEAs participa- tion is highly conditioned by trust toward Policy Makers and by clear expectations of seeing results/changes happening. There is a clear will to engage with peers for influ- encing environmental policy-making.
Ownership	YEAs recognise that it is important to be en- gaged in the process in order to make a change. Ownership also exists in participat- ing with others and in having dedicated online e-participation platforms.

After the interviews, we worked on creating personas (6 representing YEAs and 2 representing PMs) and scenarios for the platforms. The conceptual kernel of our personas was built around the environmental action needs that emerged from the interviews. Our personas also included information beyond these needs (i.e. demographics, ICT skills, life details reflecting our interviewees), for making them believable archetypes of users. As an illustration, we present three YEAs personas (see also Fig. 2), also pointing to the specific environmental action needs of each of them.

In the first example, Sofia (our persona) shows interest for local action and local environmental initiatives (experience need) and is keen on doing collective action with her peers (participation need). Sofia challenges designers to consider how the e-participation platform should support the promotion of things that are of direct interest to her, while leveraging the competencies she has to collaborate with others. In a second example, Jan is keen on participation using online spaces (own-ership need). Jan has an interest in completing actions for changing small things (experience/participation needs), in a context in which making small changes can improve the life for many (future

need). Jan challenges designers to consider supporting the competencies of YEAs to take ownership on environmental action and to offer a digital space for their ownership. In a third example, Sara while showing mild interest for local initiatives (experience need) and for local change (future need) also shows mistrust toward politics and frustration about how decisions are taken by politicians (participation obstacle). Sara challenges designers to consider YEAs, which have a skeptical view toward PMs and where e-participation needs to bridge a trust gap.





Fig. 2. Three personas from the STEP project

6. Co-creation and Environmental Action

We will discuss now some of the results of the co-creation research conducted for the project. The main assumption underpinning our co-creation was that YEAs were more likely to feel ownership toward the final e-participation platform by incorporating in it some of their ideas directly related to environmental action. We present results related to two of the personas seen earlier (Sofia and Jan). During a workshop in Spain (workshop 2) with YEAs, participants discussed a number of ideas for Sofia. YEAs proposed that the platform could present Sofia with a calendar highlighting relevant local and global environmental events and volunteering activities. This idea connects with the direct experience dimension of environmental action. Participants also suggested that Sofia could have the ability to start petitions (a solution for environmental action ownership) and to send these to relevant PMs, once enough signatures are reached. Workshop participants also suggested that the platform should include reports on what has been done by PMs with the e-participation inputs that Sofia could consult. This was seen as a solution to reduce the trust gap between Sofia and PMs. Participants of the workshop proposed that for Jan there could be the ability to create groups within the platform to allow him to reach out to others for arranging activities etc. This feature can be associated with the need of ownership and spaces dedicated to YEAs. A further proposition was a forum/chat that Jan could use to start dialogues with new and different people, including PMs. The option of small subscriptions with the money going to environmental causes was another feature suggested during the co-creation. Some participants said that this could get participants to think more in the long-term about the environment. Fig. 3 illustrates the use of the personas during the workshop and how these user archetypes were paramount for supporting the co-creation work with young people.



Fig. 3. Use of the personas in supporting the work with YEAs

YEAs also produced interesting ideas for the landing page of the platform. We will concentrate on three examples. In a workshop conducted in Czech Republic (workshop 3), participants placed emphasis on having the home-landing page of the platform showing what happens at a local level, where local was intended from the city/village up to a country level. This can be seen in the two sketches in Fig. 4 where both "news from the locality" and a tabs organisation of the homepage could facilitate this. However, participants also emphasized the importance of having features supporting Europe wide e-participation. For the landing page, participants also proposed a welcoming message about a "new generation" taking ownership and leading to deliver a better environmental Europe.



Fig. 4. Co-created landing pages ideas (Czech Republic)

In another workshop conducted in Turkey (workshop 5), participants wanted an inspiring social message on the homepage, remarking the importance of environmental values for young generations and their future. Participants also proposed a tree logo, stating that one side of the tree represented the old part of the city and the other is the new and developing part of the city, highlighting environmental issues on both sides. This group wanted to convey the message that their city is multicultural and that young people are ready to support a better environment to live in.



Fig. 5. Detailed sketches for a landing page proposed by YEAs (Spain)

In a further workshop in Spain (workshop 4), participants generated very colourful and imaginative landing pages demonstrating the features that they would like to see on the platform. Some very detailed sketches were drawn as shown in Fig. 5. The features for the platform proposed by YEAs in this workshop included among others: leaderboard, projects/events area, news feed, links for sharing via Social Media, tabs, notices/images/services, activities/games and the inclusion of local landmark symbols.

In general, the workshops also produced further confirmation that there is a lack of confidence in politicians and the belief that things will be resolved. YEAs remarked that politicians are not interested in the environmental issues and they do not seem to care what young people think. Interestingly, when young people role-played a political role during workshops, they reacted with a very strong personality and gave sanctions instead of options.

In conclusion, not all the ideas proposed by participants during the co-creation found their way into the final design of the platform (e.g. the crowdfunding) and some were already planned and designers thus received confirmation of their plans (e.g. creating petitions). However, new functionalities have arisen from the process, for example, the chat allowing participants to talk directly with other participants, the option to create small groups and the requirement to have PMs publish a report about the actions undertaken as outcome of the environmental e-participation process.

7. Evaluation Results

In January 2017, an advanced prototype of the e-participation platform was released for the piloting activities. Alongside the piloting, we conducted an evaluation to understand how the platform was meeting the project objectives and to understand whether the platform was ultimately capable of supporting YEAs environmental action.

7.1. Participation theme

From our analysis of the evaluation data, it is possible to see how the design of the platform supports YEAs' participation needs of environmental action. In the questionnaire, we asked YEAs whether the platform could increase general youth participation in environmental policy-making. An analysis of the answers show a relatively positive response at 66% (n=119, sum of Strongly Agree and Agree) and negative (excluding Neutral) at 11% (n=20, sum of Strongly Disagree and Disagree), which suggests that respondents did find good opportunities in the platform for collective participation supporting youth environmental action toward policy-making.

One core aspect of participation identified during early interviewing relates to the trust (or lack there of) between YEAs and PMs. In the questionnaire we asked YEAs whether, after they used the platform, they were more able to trust local PMs. As we can see in Fig. 6, half of the respondents (49%, n=89) saw their capacity to trust local PMs increased, however the trust gap identified in earlier qualitative interviews still remains an aspect which the platform in itself cannot fully address (with negative responses amounting to 16%, n=29, while the Neutral are at 35%).



12. After using STEP I feel more able to trust local policy makers

Fig. 6. STEP and YAEs trust in local PMs

Below we present some excerpts from interviews with PMs, which illustrate why, from their perspective, the trust gap between them and YEAs still remains an issue. Respondents remarked that the challenge of building trust through e-participation will inevitably take more time:

To speak about increasing trust it's really too early. The platform can help us ease communication between the administration and the Young People, it will probably take a lot of time to build trust though. [PM_EVAL3]

The opinions that the guys bring they should actually happen to make them gain more trust. It can [take] years maybe to do something like that. [PM_EVAL1]

Indeed, while the ambition to bridge the trust gap should be part of any e-participation platform design, this also seems beyond the capacity and time-frame of a single project. Policy creation and implementation do have a different timing compared to the e-participation in itself and it will take time to see practical effects from what was piloted during the project. Nonetheless, PMs did see advantages in the transparency of the environmental policy-making process that the platform could offer, as the following excerpt well illustrates:

It's good to be direct with young people even though not all of them share the same idea but I think it helped to gain trust. It made us more familiar, more accessible. [PM_EVAL5]

The evaluation then showed that the e-participation platform did play a role in bridging the trust gap, despite PMs recognising that this will require more time.

7.2. Participation and expectations theme

We have seen in earlier qualitative interviews that an important need for YEAs was that their participation in environmental decision-making is conditioned by seeing their inputs taken forward by PMs into concrete actions. In the questionnaire, we asked YEAs about the level of feedback they have received on their contributions, during the piloting activities. This question provided a positive response from 50% of participants (n=90) however we also had a large component of neutral responses (37%, n=68).

Some YEAs interviewed for the evaluation saw some limits in the responses received from PMs, pointing out that the discussions in the platform did not always seem to have a clear goal:

The platform works as a first step, informing people of the issue and then getting them to express an opinion, but to really hook people you must also give them something – give them a sense of purpose [YEA_EVAL6]

The problem is not what happens with the dialogues – but what happens now. I have contributed my idea – but now what? What happens next? If I see something happen I will continue to use it – if not then I won't. I'd be happy to continue – it's fun, but I want to see results. [YEA_EVAL1]

Some excerpts from the interviews with PMs can help to better contextualise the issues and show why the platform may not have immediately produced what YEAs were expecting. Firstly, PMs were genuinely active in giving feedback and were motivated in implementing concrete actions responding to the YEAs contributions, first of all via the reports on dialogues (one of the features identified with co-creation):

Young people have been participating a lot, we have been aiming for the target numbers. Our next challenge however is to make a report on every single dialogue, then to email this report back to the users who were involved and then tell them what's going to happen. [PM_EVAL9]

Furthermore, PMs were also excited on having seen dialogues providing novel ideas for them to consider:

Sometime the dialogue can lead on to things beyond the dialogue. This is a precious output for us as a municipality – maybe the output has nothing to do with the list of activities. Sometimes the value is in other areas. [PM_EVAL9]

From the evaluation, it emerged however that PMs face an issue of managing YEAs expectations. In some cases, there was a problem of whether the current state of affairs would allow PMs to deliver on the e-participation results. In other words, while some ideas promoted by YEA may be interesting, some public authorities do not have the means to implement them. In the following excerpt for example, a PM recognises that the local authority lacks the infrastructure to solve the issue of wastewater management that YEAs have been discussing during e-participation:

Yes, some of the problems cannot be solved easily because if there is no infrastructure, example for the wastewater management, if there is no infrastructure no-one can do anything.... [PM_EVAL7]

The following excerpt shows anyway that YEAs also have an understanding that policy makers may face limits and that a new policy process and implementation may require time to emerge:

I think its not going to change everything from the day to the night and that will be it, [...] but for the young people to be engaged, there is a response required by the town Hall even though the processes are slow because there are a lot of different factors that play a role in application of policy. [YEA_EVAL3]

Moreover, some PMs were wary of the problem that YEAs were expecting instant responses to their inputs perhaps fueled by the communication medium, in a social media like fashion, but that such an instant response was not immediately achievable. PMs remarked that this was an expectation that needed to be managed for the e-participation to be both realistic and successful.

7.3. Ownership theme

We have discussed earlier that the ownership dimension of environmental action is an important need and this also relates with dedicated spaces where young people can use their competences and take responsibility for the protection of the environment. In the evaluation questionnaire, we asked whether the platform constitutes a good medium for YEAs to bring their ideas/concerns to PMs. Responses we received were very similar to those we have seen before, with 57% (n= 103) positive responses and 12% negative (n=21), with a remaining large neutral component.

Some YEAs we interviewed saw the importance of having the e-participation platform as a space where they could exercise their ownership on environmental issues:

I have just been reading the comments and liking them and thinking about different ideas to parks in the near future but yeah people are actually getting involved and I had a chance to read a couple of comments and ideas about them. [YEA_EVAL3]

In the above, the interviewee sees the platform as a space where YEAs had the opportunity to be involved (by reading, commenting etc.) and to express their positions. The following excerpt goes further:

If you suggested to me that tonight, I should go to an exhibition about climate change I wouldn't go, I prefer to stay on my couch, but if I have an application about e-participation, where I can just type my opinion, and I can interact with others and from other regions then this is appealing. [YEA_EVAL4]

In this case, the interviewee seems to argue that traditional spaces (like an exhibit) may not be that attractive to YEAs, however an e-participation platform offers enhanced opportunities to be involved with others, allowing people to exercise their environmental action ownership from anywhere. The following excerpts, further remark on the importance of the platform as a space for YEAs environmental ownership:

I really liked the idea of a platform dedicated to Young People and the idea of relating Young People with the politicians, and them seeing what we think and what we think we need, because we are like the future you know. [YEA_EVAL7]

I think the platform will help, because although obviously we can go to the door [of the Town Hall] and say 'listen to me' the fact is no-one will, and the platform is going to help us is in this way, so I think it is good. [YEA_EVAL7]

It emerged then from the interviews that with the platform, YEAs thought they could demonstrate to PMs what they think and project this toward the future. Moreover, one of the interviewees argues that direct contact will not help YEAs get their message across to PMs (they saw the Town Hall as a space 'for them not us', it was a physical and mental barrier to participation), but the platform would offer this capacity.

7.4. Future theme

A core environmental action need for young people is their capacity to project their actions toward achieving future outcomes. Indeed, young people may be driven to act because they feel they have a role and a duty in making changes for future generations. An important aspect of this relates to the future involvement of young people in the environmental policy-making process. In the questionnaire, we asked YEAs whether they would recommend the future use of the platform to their peers. We had a strong positive response to the question (77%, n=139) with the largest set of responses as Strongly Agree (Fig. 7), with very limited negative ones (n=4 <3%).



15. I would recommend the STEP platform to other young people

Fig. 7. STEP and YAEs recommending the platform to peers

In the interviews, some YEAs acknowledged that the platform offered the opportunity to, collectively, make a change and they projected their action toward the future. Some of these futures are relatively short-term and related to changes at the level of the municipality/region: [the] best thing is the possibility that the different parts of society, different citizens can come together to connect and share ideas. But also at the same time have the connection to the Town Hall in order to make improvements. I really like this opportunity in order to debate and discuss different ideas that, at the end of the day, are going to improve the life of everyone. [YEA_EVAL12]

Other expressions of projection toward the future were long-term and infused with some idealism on changes for future generations or the planet:

The platform is helping because it gets into the citizens and they teach it [environmental knowledge] to the little kids and when they grow up, then they are gonna be aware about it. [YEA_EVAL7]

Or for making YEAs change attitude toward what is important for life, by thinking beyond the immediate situation:

Sometimes, the Young People are like, 'I'm young and I don't care about what is happening, I'm gonna just live the crazy life!' you know and I feel it [STEP] will help us to know a little more about what is happening here. [YEA_EVAL7]

It is clear that YEAs also have long-term aspirations toward the environment and saw the e-participation platform as a tool that could help solve long-term environmental challenges and overcome existing barriers and problems.

7.5. Direct experience theme

We have seen in pre-piloting interviews that e-participation in environmental policy-making could have more grip if the process was about local issues on which YEAs have a direct interest. This relates to the direct experience dimension of environmental action and is an important need for e-participation. In the questionnaire, we asked explicitly whether the platform was supporting YEAs involvement in local environmental issues. We see in Fig. 8 strong positive responses overall (71%, n=128).



Fig. 8. STEP and YAEs on local environment

What follows in an excerpt from a PM interview acknowledging the importance of the experiential dimension of e-participation for young people:

I think that is what we are saying you have to really know very well your society, what they are expecting, which are the expectations and demands and to try to run some dialogues that are really key for them. [PM_EVAL3]

YEAs also emphasised that e-participation to environmental issues must be tied to what is important for them, rather than on far away problems:

There is a huge environmental problem in the region, Water management is a big issue – everybody knows it. [...] People also really think they don't have the feeling of Climate Change. When you transform the issue into something tangible, then it's easier to talk about it. So for example, Water management is easier to discuss than CO2 emissions and global warming [YEA_EVAL6]

Thus, our evaluation did measure the platform's capacity to support e-participation on local matters, in line with the experiential dimension of environmental action. However, not everything that is local constitutes something of interest for YEAs. One of the pilot regions used the platform for dialogues around Consultations on Environmental Impact Assessments (CEIA). This was not very appealing for YEAs because these documents are rather technical and outside their interest. Below is an excerpt where the respondent makes this clear and compares the CEIA with other local topics that can instead easily drive participation:

So the dialogues about Climate Change and Water Management in the Region, or the Caretta Caretta, these are things that people know about and can form an opinion about and express it. [...]

When it comes to Environmental Impact Assessment, then, for example the one about the hotel being built, well, people think 'OK - It's not my job to know about this' [YEA_EVAL6]

Below is an excerpt from a PM interview, acknowledging this problem:

....they [YEAs] are more interested in issues put on debate than on the Environmental Impact Assessment, they are technical things containing terms that most young people do not understand, hard for them to express an opinion [PM_EVAL7]

Thus, it is not that "local" always equates to direct experience and immediate interest for YEAs. This is an important lesson showing that the content of the local decision is also important for fostering YEAs environmental action.

7.6. Summary on environmental action and e-participation

Table 4 summarises the findings of the evaluation and the relations between environmental action and e-participation.

Dimensions of Envi- ronmental Action	Environmental Action and e-participation in Evaluation
Experience	Our analysis suggests that e-participation in environmental policy- making fares better when the discussion(s) revolves around things that are tangible to the life of young people. Too technical and "out of touch" local issues did not drive participation. An e-participation platform can help young people better understand issues and allow them to contribute to the local environmental decision-making.
Stakes in the Future	The e-participation platform was seen as positive for making changes and improving the future of the environment. Being lis- tened to and seeing follow-ups from PMs were mentioned as im- portant aspects of this. Respondents did see both immediate effects on the future but also expressed more idealistic positions about long-term outlooks.
Participation	The e-participation platform was seen by young people as a tool fa- cilitating direct collaboration with PMs on environmental issues. Although the trust gap was seen as a long-term problem to solve, directly tied with young people seeing tangible outcomes as results of their inputs.
Ownership	Through the evaluation we have seen that a platform may offer a space for young people and that a platform offers a medium through which young people can get across their message to PMs in relation to environmental change.

Table 4. Dimension of Environmental Action in e-participation evaluation

8. Discussion and Conclusion

This paper has discussed a research case study that shows how it is possible to connect the concept of environmental action and the process of designing and deploying an e-participation platform for environmental policy-making for young people.

An initial literature analysis supported the identification of the concept of environmental action, over that of environmental attitude or behavior, as a potential basis for the design of environmental e-participation. The main assumption was that the intentionality of environmental action and its participatory nature would support young people's engagement with environmental policy-making. Following this, four core dimensions of the concept of environmental action were identified from the literature as the basis for furthering our research: experience, ownership, participation and stakes in the future. By conducting semi-structured interviews we have identified the environmental action needs of young people in relation to these four dimensions of the concept. The findings from the interviews were then used to create personas and scenarios to elicit end-users environmental action needs and then, via co-creation activities, some solutions to these needs have been envisioned. We have also seen how the effort to embed the concept of environmental action in the platform design was evaluated positively and using environmental action as a lens for the evaluation allowed for the identification of persistent critical issues such as the lack of trust that young people have toward PMs. In summary, the main contribution of our study to research and practice has been that of offering a conceptual basis and a practical example for the design, deployment and piloting of novel solutions for e-participation in environmental policy-making for young people (and possibly beyond). We believe that our conceptual approach and the methods we proposed offer lessons that can be replicable to other environmental e-participation experiences.

A recent book on European E-Democracy in Practice (Hennen et al., 2020) gives some useful insights into the use of digital tools for various democratical methods across a range of areas. The final chapter on improving e-participation at the EU level is particularly insightful, highlighting that the apparent failure of e-democracy to live up to its potential has little to do with digital communication and everything to do with the lack of openness of institutional decision-making processes. Santini & Carvalho, (2019, p. 178) agree with this sentiment, stating that "online political participation is not only a technological question, but also a question of power. The efforts to enable effective political participation in online platforms go far beyond the creation and implementation of new digital platforms". Transparency, education and seeing that the deliberative process has an impact on the decision making process are all important and our findings from this project confer with these statements.

Royo et al. (2014) have produced a study measuring the level of commitment of local public authorities which excplicitly declared their adherence to the principles of the Aarhus Convention, in particular toward environmental e-participation and the involvement of citizens. The authors show that the level of commitment toward the declaration does not always translate in authorities offering active e-participation processes, using tools such as petitions and others. There seems indeed a gap between intention and practice. The platform produced by the STEP project was designed with the intent of facilitating e-participation processes for local authorities, under the umbrella of the Aarhus convention, and the municipalities and regions involved in the piloting benefited from the opportunity to test out novel ideas and instruments which, from our evaluation, helped them in mobilising their youth toward some forms of collective consciousness about environmental issues in their areas. The problem of commitment identified by Royo et al. (2014) is, from what we have seen during our research, often tied with a problem of resources which are not always available, which at the very least require some investements in time and resources, a tailored communication strategy and a number of people (e.g. civil servants or directly policy makers) to be actively involved in the process. It was also clear from our analysis that some of the environmental problems that local authorities face directly may not be of direct interest for young people, as in the case of the environmental impact assessments, and that these cannot foster substantial participation.

e-participation is a concept and a set of experiences which have been developed and researched at least since 2003, the period in which a number of seminal-influential papers were published (Macintosh et al. 2003; Macintosh et al. 2004), accounting for early experimentations and projects. In literature, there have been attempts at systematising the field, either through systematic reviews (Sanford and Rose, 2007; Susha and Grönlund, 2012; Medaglia, 2012; Santini & Carvalho, 2019)) or frameworks (Tambouris et al. 2007; Wirtz et al. 2018). Studies sought, in particular, to identify what theories and approaches can underpin e-participation. In a systematic analysis, in particular, Susha and Grönlund (2012) showed that much of the literature concentrates on the political communication theory aspects of e-participation, while other contributions relate to contemporary social theory. There are also approaches concentrating on the technological solutions.

A further contribution of our study to research practice is in showing that it is possible to seamlessly connect the above three areas from Susha and Grönlund (2012) - political communication, social theory and technology - in relation to environmental e-participation. Environmental action is a concept that has an increasingly political dimension, with a focus on young people conducting collective action for achieving long-term changes. Moreover, by being based on the notion of social action, environmental action connects with general social theory in relation to the intentionality of action. However, our research also critically supported the technical development of an e-participation platform, through an effort to translate the dimensions of environmental action into practical ideas for designers. As part of the project we also have produced a report highlighting the lessons learned and a potential roadmap for future e-participation endeavours (STEP Consortium, 2017).

Following this, we can, from our results, offer some practical recommendations for the design and conduction of e-participation:

- Prioritise action over attitude: positive attitudes toward issues such as the environment which may be the subject of e-participation may exist, however it is preferable to base a project on supporting action as e-participation ultimately requires people's active involvement. Moreover, the notion of action is more inclusive and supports the participation of both people that are positively engaged with e.g. the environment, but also those who are not and are driven to act for other reasons, such as interests in local matters.
- Design for action: an e-participation platform design should strongly encourage action. We recommend that the dimensions of an action such as environmental action are taken as the basis for the design. This can support participating actors in satisfying at least some of

their needs, such as increasing trust in politics and seeing concrete results from their participation.

• Evaluate the action: the notion of (environmental) action can also serve as the blueprint for evaluating the achievements of e-participation. While it is unlikely that an e-participation process can achieve all its initial goals, it is possible to evaluate what was achieved by measuring the extent to which people perceive their action was supported by a platform, such as, the capacity to influence change.

We acknowledge that this research also has limits. Firstly, our research was part of a larger endeavor aimed at developing a marketable solution. While this was in itself a positive aspect of the project, it also shaped our research. In other words, the focus of the project was as much on building an usable tool for the market of local authorities in Europe as on creating new knowledge on eparticipation processes. For instance, we did not have the capacity to explore certain sociological issues with greater depth and had to concentrate on delivering insights that would make the platform a near to market product. Sociologically speaking, some issues that emerged during our work could have been studied in a more extended manner. For example the issue of trust, in order to propose long-term solutions. Secondly, we concentrated on similarities across the pilots, rather than on differences, as the goal was to find common ground among a variety of experiences. This focus on commonalities did not allow us to concentrate on the political or social specificities of the different pilots Thirdly, on a methodological level, some aspects of our research design did present some limits at the time of conduction. For example, there often is a need to do co-creation with end-users in order to better serve their needs, but in practical terms, some of the aspects we have unveiled via co-creation did not find their way into the final platform. This ultimately may have had an impact on the sense of ownership toward the e-participation platform. Finally, one could argue that in an evaluation participants who contributed to the design of a product would favour that product and rate it higher than a disinterested party. It may be that some of the results of our evaluation suffer from this potential bias. On this aspect we have to consider that we worked on a funded project with a fixed number of piloting local authorities. Both the design and the evaluation had to be conducted within the boundaries of these partners, in order to complete the process of design and testing of the platform. However, the number of YEAs who participated in the piloting activities and in the evaluation activities were far greater in number than the ones who were involved in the early design phases and we are confident that this bias was overall limited in our results.

To conclude, the presented research offers an important lesson for the design of e-participation as it shows that social action and platform design should be connected. Through a series of empirical research activities (comprising interviews, questionnaires and co-creation) we have identified how environmental action, and especially the four dimensions of ownership, participation, stakes in the future and experience, are seen as important needs for young people's involvement in the e-participation process. We have then made an effort to embed the four dimensions of environmental action in the platform design and we have evaluated our results, showing how environmental action can support the delivery of environmental e-participation.

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Cracking the political code: the case of e-participation in Colombia

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Abstract: Theory says that, in normal circumstances, politicians do not have many incentives to make the policy process more democratic, and that these political dynamics may be embedded into the enactment of technology. This work will try to determine if this holds true in the case of Urna de Cristal, a Colombian e-participation scheme. The nation-wide projects implemented by this programme in 2017 are analysed using three sets of political criteria—inclusion, participation, and deliberation—drawn from an evaluation framework of centralized cross-platform approaches to social media exploitation by government agencies (Ferro et al. 2013). The evidence suggests that the enactment of Urna de Cristal's projects reflected the Colombian government's intention of preventing the policy process from becoming more participatory and deliberative. Some data suggests the government tried to render this process more inclusive. Further research on e-participation should consider the political complexity of technology enactment in the public sector.

Keywords: e-participation, technology enactment, digital government, politics of the digital

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1. Introduction

Information and Communication Technologies (ICTs) are deemed as a very powerful tool to further democratic values such as public transparency, government accountability and openness, as well as citizen collaboration and participation (Becker 1998; Bertot et al., 2010; Kim et al., 2007; Obama, 2009). Nonetheless, the first scholarly works on digital government focused on achieving the horizontal integration of services across government (Layne & Lee, 2001) and, above all, on increasing public sector efficiency (Heeks, 1999). It was later that authors such as West (2004) considered that the final stage of e-government development should include the creation of an "interactive democracy" and

"a range of accountability measures". Far beyond this recognition of the strong connection between furthering democratic principles and the evolution of digital government, Weerakkody et al. (2011) coined the concept of "transformational government" to refer to a whole new tier of technologyenabled change in government in which different public-sector objectives are met, including efficiency, transparency, accountability and citizen centricity. Accordingly, a "first wave" of e-government-related changes would have streamlined government processes and improved public service delivery (Dunleavy et al., 2006), whereas a "second wave" would have facilitated co-production of services, and enabled citizen online testimonials and evaluations, as well as open book government and citizen surveillance (Dunleavy & Margetts, 2013). Nevertheless, it should be noticed that there is evidence of e-participation being in the political agenda long before this second wave took place (OECD, 2001; Scottish Parliament, 1998; Whyte & Macintosh, 2001).

In this context, the central governments of a number of developing and developed countries have decided to run e-participation schemes, this is, technology-enabled projects that, at least on paper, pretend to render the policy process more inclusive, participatory, or deliberative (UN, 2016). These public programmes would be a great example of the close relationship between technology and democracy since e-participation would enable people to be better informed of how decisions are made (inclusion), express their opinions in the process (participation), and even influence the policy output (deliberation). This, of course, is more complicated in practice. As we will see below, the literature suggests that politicians do not often have many personal incentives to allow people to partake in policy decisions. Those in office have probably invested time and money to hold their privileged positions within the political system and, therefore, they would not be willing to give their power away to the people. Moreover, the e-government scholarship argues that the enactment of technology is affected by technical, organisational, social, and political factors, and that these factors may also be embedded into it. Therefore, even though governments formally run e-participation projects, the technologies involved in the implementation of these schemes might be enacted in a way in which it is unlikely for them to render the policy process more inclusive, participatory, or deliberative.

This work will try to test if this holds true in the case of Urna de Cristal (literally "Crystal Ballot Box"), an e-participation scheme run by the Colombian government since 2010. The analysis is carried out following a very simple plan. To begin with, the next section presents a brief review of the literature dealing with the political and technological complexity of e-participation, with a particular emphasis on the political intentions of the (executive) government authorities implementing such projects. Then, the third section outlines the data and methods used to conduct the case study, while the fourth presents and discusses its results. The final section concludes.

2. Literature review

2.1. What is e-participation?

Participation has traditionally been considered one of the main three components of open government. When Barack Obama (2009), more than a decade ago, issued his famous Memorandum on Transparency and Open Government, instructed the U.S. Office of Management and Budget (OMB) to pass a directive following three key principles: transparency, collaboration and participation. This Directive ended up declaring that participation is needed for governments to embrace the ideas and expertise of citizens and, therefore, to make better policies (Orszag, 2009). This idea of participation would imply that the "middlemen" that intermediate between the government and citizens –representatives in Congress, for instance – are not always necessary and that citizens should be empowered to create a (more) direct and open democracy (Fung et al., 2013). Nonetheless, since participation, and especially e-participation, may also be part of collaboration and transparency measures, Abu-Shanab (2015) have proposed replacing Obama's three foundational principles with four new open government dimensions: i) transparency, ii) information accountability, iii) collaboration and iv) empowerment.

The academic definitions of e-participation have been faithful to the political conceptualisation of participation. Medaglia (2012, p.346), for instance, considers, following Macintosh (2004), that eparticipation implies "the use of ICT to support democratic decision-making (...) enabling opportunities for consultation and dialogue between government and citizens". Similarly, Sanford & Rose (2007, p.408) suggest that e-participation would enable a technology-mediated interaction between the civil social sphere, on the one hand, and either the formal politics sphere or the administration sphere, on the other hand. These definitions have been challenged by Susha and Grönlund (2012). While they admit that e-participation is strongly linked to the broader e-government (and open government) scholarship, they draw a strict distinction between e-participation and e-democracy. Eparticipation may be used for achieving undemocratic or neutral goals, and its scope and methods would span beyond politics - it is not necessarily a political issue since it may be related to public service delivery or even to private-sector practices. Somewhat aware of this critique, the United Nations (UN) conceive e-participation "as the process of engaging citizens through ICTs in policy, decision making, and service design and delivery in order to make it participatory, inclusive, and deliberative" (2016, p.49; emphasis added). These distinctions are, however, only theoretical simplifications that help students to better understand the areas of government impacted by e-participation. In the real world, these dimensions-policy and decision making, service delivery - are more complex and intertwined. Just consider the case of an e-voting system, a public service delivered by the administration sphere to facilitate participation in democratic processes.

Despite these concerns, the study of e-participation remains politically biased. Different literature reviews (Sanford & Rose, 2007; Sæbø et al., 2008) show that e-participation is usually related either to political deliberation or decision-making processes. In this context, Susha and Grönlund (2012) argue that most scholars take for granted that the goal of e-participation is to create a direct democracy—the Internet would be deemed as the panacea for creating a powerful public sphere where anyone is entitled to participate (Chadwick, 2008). This normative assumption, however, will be seriously scrutinised in the next section.

2.2. Why would government authorities further e-participation?

It's very difficult to deny that new technologies and digital innovations have transformed government. Twenty-five years ago, Osborne and Gaebler (1993) managed to write a bestseller on reinventing government with almost no mention of information and technology (Heeks, 1999). Today, that would be simply impossible. At least since the nineties, ICTs have been broadly and actively embraced by almost every government office in developed and developing countries (Dawes, 2008; Margetts, 2003), digital technologies have ostensibly changed administrative procedures (Hood 2000; Vintar 1995), the investment in technological solutions has become an important part of the public budget (Heeks & Davies, 1999; Margetts, 2003), and digital strategies have played a key role in transformational schemes (Gore, 1993; Heeks, 1999; Heeks & Davies, 1999; UK Cabinet Office, 1999, 2017). From an external viewpoint, all these transformations have contributed to changing the form in which governments interact with citizens and stakeholders (Hood & Margetts 2007; Wong & Welch 2004). For many, the government is not just a group of people anymore, but also a "platform" (Bracken, 2015; O'Reilly, 2011). As a matter of fact, nowadays a person looking for public information or applying for a government benefit is more likely to interact, at least in early stages, with a webpage than with an actual civil servant.

This, however, does not necessarily mean that information and technology have radically transformed government. Most scholars agree, based on empirical evidence, that ICTs have only produced limited and incremental change in public-sector structures (Dawes, 2008; Dwivedi et al.,2012; Luna-Reyes & Gil-García, 2014; Margetts, 1999, 2003; Scholl, 2005; Norris & Moon 2005, West, 2004). Accordingly, technology would not bring about change by itself but as the result of an interplay between different factors. Put differently, technology would not directly and deterministically cause a transformation of government, but would enable this change to happen (Buffat, 2015; Weerakkody et al., 2011). Then, technology-enabled change would be favoured or deterred by technical, political, social, institutional and organisational influences (Cordella & Iannacci 2011; Dwivedi et al., 2012; Fountain, 2001; Heeks & Davies, 1999).

From a political perspective, digital government projects may also be studied through the lens of the power relationships in which they are designed and deployed. In this line, the power networks that Foucault (1980) called *dispositifs* might be helpful to explore the relevance of these interactions. Indeed, following Foucault's ideas, "power does not manifest itself as an institution but rather as continuously functioning nets of relationships that form into chains with each other" (Eriksson, 2005), as shown by the study of power-knowledge structures in the digitalisation of government and public administration in Estonia (Björklund, 2016) and the establishment of Citizen Service Centres in Greece (Introna et al., 2009). Moreover, from an action-network-theory perspective, "power is always in relation to something or someone else" and thus allowing citizens into policy making would not only change the network structure but also, and maybe more importantly, the ability of those in control of the process to enact their power (Heeks & Stanforth, 2007).

In this context, it's clear that the analysis of e-participation cannot overlook the political dynamics that would enable technology to bring about its potential benefits. The literature has suggested that the match between e-participation and more democracy is largely oblivious to the fact that political

authorities do not have enough personal incentives to promote more inclusive, participatory or deliberative policy processes (Chadwick, 2008; Fung et al., 2013). Put differently, it is unlikely for politicians that have spent time, money and (maybe) labour on reaching a certain position to give back their power to the people without obtaining anything in exchange. In this line, Chadwick (2011) shows that one of the factors explaining the failure of an e-participation project in a U.S. local government was the "political ambivalence" of its councillors, this is, the decoupling between formal and actual political support. Similarly, but with different results, Ahn and Bretschneider (2011) have demonstrated that the political motivations of the mayor of Gangnam-gu were vital to the success of the e-participation strategy of this Korean district.

Nonetheless, scholars usually correlate the success of e-participation projects to user preferences, attitudes or relations with technology (Zolotov et al., 2018), functionality (Zheng, 2017), institutional conditions (Chadwick, 2011), and organisational structures (Zheng et al., 2014). Thus, the importance of political interests and personal incentives has been largely disregarded by the e-participation literature (Panopoulou et al., 2014) and cross-national studies (Girish et al., 2014). This apolitical approach towards its success factors is contradictory with the above mentioned understanding of e-participation as a political question closely connected to democracy (see Section 2.1.). However, it fits quite well with the ideas of Fountain (2001) who famously drew a distinction between objective technology (e.g. e-mail) and enacted technology (e.g. the actual use of e-mail). For her, the enactment of technology would be determined by organisational forms and institutional arrangements, as the "cultural assumptions" of an organisation about ICT (Bellamy & Taylor, 1998). Orlikowski (2000) had previously admitted that the same technology may be enacted differently depending on both internal and external factors. She even acknowledged that technology was not necessarily neutral nor "objective" but downplayed the role of content previously inscribed into ICTs since it would be later altered and manipulated by human actions.

This socio-technical perspective is fairly successful in explaining why the same technology is enacted in different fashions in different settings. Nevertheless, it seems to overlook the fact that ICTs are not only affected by political dynamics – they may also be intrinsically political (Winner, 1999). Indeed, Cordella & Iannacci (2010) have shown that there is no such thing as "objective" technology since technical, organisational and political variables are embedded into them. Put differently, technology is shaped and reshaped by political dynamics. In this line, it has been proposed that the enactment of ICT in the public sector would embody the political intentions of the elite in office and, therefore, it is unlikely for it to produce radical change in power structures (Dawes, 2008; Holliday, 2001; Hood, 2006; Hood & Margetts, 2007; Kraemer & King 1986; Rethemeyer, 2007). Then, those who foresee that blockchain technology will transform the centralised government system into a "networked governance" in which power is not fully concentrated in any institution (Keyser, 2017; Ølnes et al., 2017) would be as misguided as those who thought the e-mail would alter the hierarchical structures of public bureaucracies (Meijer, 2008).

e-Participation technologies should be examined through the lens of these academic concerns and the UN (2016) have provided a very good starting point. They have developed a framework that distinguishes three broad levels or categories in which ICTs can be enacted in the context of e-participation schemes. The first level is *e-information*. This would be the "safer" one for politicians – in

this case, the government would restrict the use of technology to informing people about their work and achievements, and therefore it is hard to distinguish from transparency measures (e.g., open data portals, press releases, etc.). At a second level known as *e-consultation*, citizens would not only receive official information but also would have the opportunity to express their opinions using technological resources. The third level is more ambitious that both e-information and e-consultation. Indeed, the so-called *e-decision-making* level would imply that citizens are entitled to influence policymaking. At this point it is important to remember that, according to the literature, in normal circumstances, politicians do not have many incentives to share their powers with third parties (citizens, the Congress, journalists) and, therefore it would be unlikely for politicians to adopt e-decision-making strategies. The 2016 UN survey on e-government confirms this expectation – just 38 out of 193 member states declared that at least one of their e-consultation initiatives have ended up influencing a policy decision. This categorisation is really useful since it helps to easily group different e-participation schemes under the umbrella of just three well-established clusters, but it should be noticed that it is also a simplification – the actual enactment of technology is more complex and unique in each case.

In addition to the general UN framework, there are also more technology-tailored categorisations that may be helpful to test the idea of politics being embedded into ICTs. Mergel (2013a; 2013b), for instance, argues that governments usually adopt three different strategies with regards to the enactment of Social Network Sites (SNS): the push strategy, the pull strategy and the network strategy. The *push strategy* refers to the use of SNS as just an extension of regular online tools, this is, as if every government post on social media was just a press release or a public announcement. On a pull strategy more interaction with citizens is allowed in order to lead them to visiting the official government website on which more (official) information would be found. Finally, governments would also develop network strategies in which public officials would use SNS to create a space of effective interaction between them and their constituencies - people would be listened to and their opinions would be taken into account in policymaking. According to Fontaine's (2001) ideas, the enactment of SNS and, therefore, the use of any of the strategies described by Mergerl would only depend on institutional conditions and organisational arrangements. Conversely, following Cordella & Ianacci's (2010) argument, the e-government policy should be also included in the formula. Then, if we consider that politicians do not have many incentives to give their powers away by making the policy process more participatory (Fung et al., 2013), we should expect that the push and pull strategies will be more likely to be adopted by the government than network strategies. The work of Mossberger, Wu and Crawford (2013) have confirmed that this was exactly what happened in the deployment of social media strategies by the local governments of Seattle, Louisville, and Chicago. This work will try to figure out if this also holds true in the case of Colombia's Urna de Cristal.

All of this does not mean that the potential of information and technology to enable the improvement of democracy should be discarded altogether. Without modern technologies, the implementation of open data portals, e-voting systems and e-participation programmes would be simply unthinkable. Thus, from a deterministic perspective, ICTs have been capable of expanding the set of tools available to the government for improving democracy. However, the literature suggests that it is not certain that these new tools will be used to effectively enhance democracy, which may be very disappointing from a normative viewpoint. Indeed, some authors are convinced that information and technology may transform government in a rather antidemocratic fashion (Hood 2006; Hood & Margetts 2007; van de Donk et al., 1995). New technologies would allow governments to control and conduct surveillance over people more effectively than ever before, threatening the exercise of the fundamental rights to privacy and freedom. In this context, big data technologies would allow governments to carry out surveillance using "easier, cheaper, and more useful" methods (Mayer-Schönberger & Cukier 2013, p.315). This poses a real risk to people's rights since harvesting information widens the asymmetries of power between government and citizens (Gandy, 1989; Solove 2001).

ICTs would be able to produce change in different directions, depending on a variety of political, cultural, organisational, and even budgetary factors. Actually, the same technologies that may help totalitarian governments to exert their surveillance powers over people may also facilitate the establishment of a data-driven public sector in which citizen needs are more easily taken into account (OECD, 2014). At this point, it should be remembered that this literature review only deals with the political intentions of the government authorities enacting technology – if the scope of the study was broadened to the entire political system, we would likely find more positive news regarding the role of citizens and civil society (Fung et al., 2013), as well as of social media as tools for political activism (Sandoval-Almazán & Gil-García, 2014).

2.3. Politics and technology

According to this brief literature review, it should be possible to scrutinise whether an e-participation project actually aims at rendering the policy process more democratic based on the way in which technology is enacted. The two basic assumptions of this analysis are the following –

- a) *The political assumption*. The literature suggests that, in normal circumstances, there would not be many incentives for politicians and policy-makers to render the policy process more inclusive, participatory or deliberative (Chadwick, 2008; Fung et al., 2013; UN, 2016). The concept of policy process is used here to generally refer to policymaking, decision-making, and, considering the warnings of Susha & Grönlund (2012), public service design.
- b) *The technological assumption.* The literature also suggests technological, cultural, organisational and political factors are inscribed into the enactment of technology (Cordella and Ianacci, 2010; Dawes, 2008; Holliday, 2001; Hood, 2006; Hood & Margetts, 2007; Kraemer & King, 1986; Rethemeyer, 2007). For the purposes of this work, this would mean that the scarcity of political incentives to render the policy process more inclusive, participatory or deliberative are embedded into technologies used for implementing e-participation schemes.

Thus, according to (a) the political and (b) the technological assumptions, in normal circumstances, it is expected that the enactment of ICTs in e-participation projects will prevent these schemes from making the policy process more inclusive, participatory or deliberative. The next section will try to find out if this holds true in the case of a 10-year old e-participation scheme in Colombia.

3. Methodology

3.1. The case study: Colombia's Urna de Cristal

The objective of this work is to test if the idea according to which, in normal circumstances, the scarcity of incentives for politicians to make the policy process more inclusive, participatory, or deliberative is embedded into the enactment of technology holds true in the case of Colombia's Urna de Cristal (literally "Crystal Ballot Box"). This is a multimedia e-participation scheme composed of a variety of projects (commonly known as "campaigns") run by the Ministry of Information and Communications Technology of Colombia (Ministry of ICTs) since 2010.

As explained on this scheme's official website (Urna de Cristal, ca. 2018), the Ministry of ICTs carries out, often along another public agency, three different types of e-participation projects or campaigns—

- *Education campaigns*. The Colombian government resolves doubts and informs about a particular policy. According to the UN categorisation these strategies would be at the e-information level.
- *Consultation campaigns*. The Colombian government provides citizens with the opportunity to voice their opinions by answering surveys, questionnaires and more specific queries. As it is obvious, these campaigns relate to the e-consultation level.
- *Influence campaigns*. In this case, the members of the public may influence policy decisions. This is what the UN define as the e-decision-making level.

All these types of campaigns are conducted at both the local and national level.

This is an excellent case to test the assumptions of this work for three main reasons. Firstly, the outcomes of these initiatives are highly regarded by the Colombian government. Indeed, it has been in place for a decade, covering all the time ex-President Juan Manuel Santos was in office. Moreover, the scheme was awarded in 2017 with an honourable mention at the government-run competition "Top Management National Awards". Secondly, every campaign is deployed using different media (i.e. technologies), such as e-mail, Facebook, Twitter, Instagram, Google+, official websites, and even offline media as SMS messages and USSD surveys. Finally, this is an excellent case because there is plenty of information about it published online – the Colombian government has published many documents which makes possible to obtain fairly detailed information on each campaign.

This work will focus on the 17 e-participation projects implemented by Urna de Cristal during 2017 at the national level. This is due to data availability — there is more comprehensive and detailed data on the 2017 campaigns accessible online — and political timing — this is the last calendar year that ex-President José Manuel Santos was in office (he left the presidency in Agust 2018) and projects implemented within that period would be a good depiction of the last stage of the evolution of this scheme during his presidency. Table 1 provides an overview of the campaigns that will be studied.

Table 1: Overview of campaigns (Urna de Cristal, 2017)

Campaign	Days	Туре	Objective	Policy status	
Colombians abroad	120	Consultation	To help the government to motivate Colombians living abroad to fill in a form for their identification	Implementati on	
Accountability Handbook	19	Consultation	To find out what people think of the new Accountability Handbook for public agencies	Designed	
E-consultation Handbook	45	Consultation	To find out what people think of the E-consultation Handbook	Designed	
OGP Principles	19	Consultation	To further the principles of the Open Government Partnership (OGP)	Designed	
SPS Accountability	16	Consultation	To answer questions about public service delivery (water, electricity, gas)	Designed	
Billing system	56	Consultation	To find out what people think of the new digital billing system for public services	Designed	
Justice Strategy 2017- 2027	80	Consultation	To consult about how the justice system can be improved	Design in progress	
Animal Abuse	37	Consultation	To consult what should be included in the new animal abuse regulations	Design in progress	
School Meals	124	Education	To monitor a school meals programme	Implementati on	
New Police Act	206	Education	To inform and educate people on the new Police Act	Designed	
Housing Schemes	9	Education	To find out what people think of the outcome of different housing schemes	Designed	
Public Services Platform	7	Education	To consult what should be included in a new platform for monitoring public service delivery	Design in progress	

Digital Documents	18	Education	To inform people of the benefits of the digitisation of administrative procedures	Designed
Plastic Bags	46	Education	To collect feedback on the new regulation on rationalization of the use of plastic bags	Designed
Colombia Wins	49	Education	To inform the achievements of the government regarding transportation, education, security and anti-corruption	Designed
Women's Day	1	Education	To celebrate the International Women's Day	N/A
Mocoa Landslide	17	Emergency	To keep people informed in the aftermath of a landslide in Mocoa	N/A

Author's work based on Ministry of ICTs, 2017a, 2017b.

3.2. Data

All the information of Urna de Cristal used in this work has been retrieved from the official website of the scheme and the social media platforms used in each campaign (Urna de Cristal, ca. 2018). The main documents guiding this analysis are –

- *Ejercicios de participación 2017* (Ministry of ICTs, 2017a). This is an official PDF file composed of the so-called "papers" of every e-participation project implemented by Urna de Cristal in 2017. These papers contain detailed data on each campaign.
- *Ejercicios de participación nacionales* (Ministry of ICTs, 2017b). This is an official spreadsheet containing quantitative information on each campaign implemented by Urna de Cristal in 2017. It also provides links to official documentation, posts on social media, etc.

3.3. Methods

The methodology used in this work consists in the application to Colombia's Urna de Cristal of a set of criteria developed based on the multi-dimensional framework for the evaluation of a "centralized cross-platform approach to social media exploitation by government agencies" elaborated by Ferro et al. (2013, p.362). In line with the preliminary conclusions of the literature review, Ferro and his colleagues identify three areas of evaluation: i) technological evaluation, ii) organisational innovation and diffusion evaluation, and iii) political evaluation. This section outlines the three political criteria, developed in line with the political dimension of this evaluation framework, that will be used to analyse if the Government of Colombia pretended to make the policy process more inclusive, participatory or deliberative while implementing Urna de Cristal.

3.3.1. Inclusion criteria

Technology enacted in a fashion in which a wider audience is reached would embody the intention of rendering the policy process more inclusive. This will be analysed by looking at –

- the number of government inputs, this is, e-mail and SMS messages sent out, posts shared online, etc. (how many people did the government try to reach?)
- the number of media used to share content with the public (what spectrum of social media users did the campaign cover? Did it narrow the digital divide?)
- the reach of each post on social media (how many people had access to the information shared by the government?)
- the length of the campaign (was the campaign running for enough time to reach as people as possible/needed?)

Additionally, citizen inputs-likes, shares, e-mails opened, answers to surveys, comments, etc. — may be used to assess the effectiveness (response rate) of these initiatives. It should be noticed that this would only be a form of control since correlating people's behaviour with political intentions goes beyond the scope of this work.

3.3.2. Participation criteria

Technology enacted in a fashion in which it is more likely to collect feedback from the public would embody the intention of rendering the policy process more participatory. This highly depends on the opportunities provided by the government for people to provide feedback on a policy proposal or similar initiative, and, therefore, would be analysed by –

- reviewing the variety of media available to give feedback (could people provide feedback on the media of their choice?), and the length of each campaign (how much time did people have to read the information shared by the government and/or prepare their feedback? How long did the campaigns intending to collect feedback last?), and
- studying the structure of the information published or the questions made to the public (was the government *really* trying to collect feedback?).

Additionally, this analysis will be complemented by looking at the number of citizen interactions that can be deemed as a pertinent contribution to the goal of each campaign. Many like, shares, jokes and comments out of topic may count as citizen input for the purposes of the inclusion criteria, but cannot be considered pertinent contributions leading to a more participatory policy process. It should be noted again that this would only be a form of control since correlating people's behaviour with political intentions goes beyond the scope of this work.

3.3.3. Deliberation criteria

Technology enacted in a fashion in which citizen inputs should or at least can be considered by the government would embody the intention of rendering the policy process more deliberative. This will be analysed by looking at two indicators –

- Firstly, the number of Influence campaigns, this is, those that not only aim at educating or consulting the public but also allow them to influence on policy decisions. This would be a strong indication as to what were the political intentions of the Colombian government while implementing Urna de Cristal. The more influence campaigns, the more willingness to make the policy process more deliberative.
- Secondly, the status of the policy subject of each campaign is a critical indicator of its political drivers. Put differently, timing is everything if the policy in question has already been developed or even implemented, the opportunities for the public to influence on them would be severely restricted by design.

As mentioned above, due to data availability and political timing, the application of these three criteria will be limited to the e-participation projects embraced by Urna de Cristal in 2017 at the national level. The campaigns implemented at the local level will only be brought into the debate when strictly necessary.

4. Findings

4.1. Application of the inclusion criteria

First, the Colombian Government sent out a fair number of messages to the public as part of the nation-wide e-participation projects implemented under the umbrella of Urna de Cristal in 2017 (see Table 2). Actually, the government sent more than 1 million e-mails (12 campaigns) and 4,519,713 SMS messages (13 campaigns) to Colombian residents and citizens in this period. This represents almost all government inputs (more than a 99% of them). Even though one person can receive more than one e-mail or SMS message, these numbers are not poor for a country with a population of 50 million people (World Bank, ca. 2018). However, when these figures are compared to citizen inputs, the real problem seems to be the low response rate of government inputs. Only a 4.8% of the e-mails sent across ended up being opened. The situation of SMS messages is also dire but slightly different. Most of the time these messages were an invitation for the citizen to call for free to answer a USSD survey (these were used in 7 campaigns). These polls received 35,425 responses, this is, a number equivalent to just a 0.8% of all the SMS messages sent by the government. Moreover, half of these responses were given in the education campaign on the New Police Act. Despite all of this, the absolute value of these responses may be significant, especially when compared to the public receiption of the campaigns on social media.

 Table 2: Government and citizen inputs by technology (Urna de Cristal, 2017)

Technology	Government inputs	Citizen inputs
Facebook	339	23,475
Twitter	382	2,706
Instagram	85	2,394
Google+	126	1,974
E-mail	1,058,411	50,084
SMS/USSD	4,519,713	35,425
Total	5,579,055	116,058

Author's work based on Ministry of ICT, 2018a; 2018b.

Second, almost every campaign used a variety of social media. All of them used Facebook and Twitter, with the only exception of the School Meals campaign which was specially designed for SMS messages. Moreover, Instagram was present in 13 campaigns and Google+ in 15.

Third, Facebook posts seemed to have had a good-enough reach but this is hard to confirm with the evidence available. Even though social media platforms were less used than e-mail and SMS messages, it should be noticed that 1 e-mail equals to 1 receiver, while 1 post may equal to a much wider audience. Then, while only 50,048 users opened (and maybe read) an e-mail, each Facebook post reached 6,721 users (and maybe readers) on average. If the campaign on the new Police Act, the most popular one, is left out of the calculus, this average number drops to below 5,000 (details are shown in Table 3). It is not entirely clear whether these are good-enough performance numbers. While 6,721 users equal to a 0.01% of the Colombian population, they also were a 5.4% of the followers of Urna de Cristal on Facebook in August 2018, and probably a larger portion of the users that were logged on during the lifespan of each post. Citizens, however, did not seem to have a considerable interest in what Urna de Cristal posted online. All citizen interactions (shares, likes, comments) on social media (Facebook + Instagram + Twitter + Google+) went up to 30,549 in 2017. This is not a particularly good number since roughly 5,000 more responses were given to the USSD surveys, and this technology was only used in 7 campaigns. The videos posted on Facebook had 130,000 more views but most of them were concentrated in one campaign – the new Police Act campaign contributed with 89,420, followed by Mocoa Landslide with 17,107, and Animal Abuse with 10,582.

Table 3: Government posts and citizen inputs on Facebook (Urna de Cristal, 2017)

Campaign	Posts	Reach (users)	Likes, Shares	Comments
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	Total	μ	Median	μ	Median	μ	Median
Colombians Abroad	23	2,768	2,656	15	12	1.3	1
Accountabilit y Handbook	13	2,560	2,395	8	7	0.9	1
E- consultation Handbook	16	2,830	2,756	16	12	2.8	2
OGP Principles	17	4,671	4,173	57	47	15.2	12
SPS Accountabilit y	7	5,773	2,563	60	17	7	5
Billing System	27	7,656	6,877	47	35	4.3	3
Justice Strategy 2017-2027	57	5,330	4,859	40	36	13	10
Animal Abuse	32	6,257	4,179	61	37	4.5	3
New Police Act	51	16,640	5,400	167	35	28	5
Housing Schemes	6	5,575	5,699	130	44	23.2	10.5
Public Services Platform	6	5,407	3,634	30	30	5.4	6.5
Digital Documents	15	4,352	3,192	10	7	0.6	0
Plastic Bags	28	4,746	3,937	36	20	3.8	3
Colombia Wins	12	2,374	2,156	16	12	3.4	2.5
Women's Day	8	2,391	2,229	19	16	3.8	2.5
Mocoa Landslide	20	6,940	4,513	83	18	3	2

Author's work based on Ministry of ICT, 2018a; 2018b. μ =average.

Fourth, most campaigns had a fair length. Consultation campaigns were in place for 49 days on average and Education campaigns for 57 days (65 if the Women's Day campaign is left out) – there were none Influence campaigns.

The application of the inclusion criteria suggests that the Colombian Government was interested in rendering the policy process more inclusive in most nation-wide Urna de Cristal projects during 2017. They sent out a fair number of messages to the public, almost every campaign resorted to a variety of media (including traditional media which would help to narrow the digital divide), Facebook posts seemed to be wide-reaching, and campaigns were in place for 7-9 weeks in average. Nonetheless, most government inputs were SMS messages, and the data on the implementation of the campaigns on Facebooks is open to interpretation. Then, a more precise quantitative analysis, taking into account budget constraints (not considered here), and data on the online collaboration of other government departments (not available), as well as the reach of social media other than Facebook (not available), may help to draw a more solid conclusion in this regard.

4.2. Application of the participation criteria

While the application of the inclusion criteria showed that the Colombian government resorted to a variety of media to share content, a review of this evaluation criterion shows that the reception of feedback was largely centralised on Urna de Cristal's official website. Many Facebook posts, tweets, SMS messages, e-mails, and USSD Surveys invited people to provide their feedback on this website, namely on online "topical debates" or "discussion forums".

The performance numbers of both types of web sections were very poor. Considering the 11 campaigns that implemented "topical debates" web sections, there were only 1,181 comments. The Plastic Bags campaign contributed with 862 of them, so the remaining 10 campaigns only received a total of 319 comments. Moreover, although many of these comments were proper feedback, a large proportion of them was composed of questions, complaints and social criticism – not pertinent contributions to the corresponding policy. The figures of the "discussion forums" were even worse. These were embraced by the Housing Schemes and the e-Consultation Handbook campaigns. In the first case, there were only 21 posts – all of them were questions for the government (e.g., what can I do to buy a house if I have a low income?) rather than feedback to any specific policy proposal. The case of the e-Consultation Handbook is slightly different. The government directly asked people how they think they could collaborate with the government in passing new regulations and, therefore, citizens provided feedback instead of making questions. Alas, only 4 people did so.

USSD surveys may have received more than 35,000 responses, but the questions of these campaigns were not aiming at receiving any useful feedback from the public. They were just used to inform them about a policy (e.g., "are you aware of the new faults regulated by the Police Act coming soon into effect?") or to keep people informed of a government policy already designed (e.g., "what is more incorrect: a) jumping a queue, b) cheating on an exam or c) buying illegal copies of a book?"; example taken from the Justice Strategy 2017-2027 campaign). This is true even in those projects whose formal purpose was to know what people thought about a policy (e.g., the Plastic Bags campaign) or to design a new policy (e.g., the Animal Abuse campaign). The revision of every government question made on these surveys in 2017, showed that not even one of them was structured in a way that could allow people to provide pertinent feedback on a policy proposal.

On social media, the situation was slightly more favourable. The government clearly asked for proposals on Facebook, Twitter, Google+ or Instagram in four campaigns: Public Service Platform, Justice Strategy 2017-2027, Animal Abuse and OGP Principles. However, the opportunities for people to prepare and give feedback were very restricted. The campaign for creating a new platform for allowing people to monitor the delivery of public services (gas, electricity, water) lasted only 6 days, in which it received 27 comments on Facebook, three on Twitter, and just one on Google+. The campaign on animal abuse lasted more than a month but almost every government post was an invitation to visit the "topical debate" website of this campaign (a "pull strategy"), where 97 people left a comment – many of them pertinent contributions though. The campaign to develop a new strategy for the justice system had similar results with just 80 comments on its corresponding webpage, while the campaign promoting the OGP principles only got 27. These figures contrast with the performance of these two campaigns on Facebook, where they received 13 and 15.2 comments on average per post, respectively.

The application of the participation criteria suggests that the Colombian Government did not have intentions to render the policy process more participatory as opportunities for providing feedback were very limited. First, just a few campaigns were really looking for citizen feedback in any way, shape or form. Indeed, the SPS Accountability and the Housing Schemes campaigns went so far as to only allowing people to ask questions to the government but without any real chance of challenging its policy proposals. Second, people usually could not choose the media of their preference to provide feedback and needed to take several steps before being able to do it since its reception was centralised on an official webpage – posting on Facebook or other social media was not enough. Third, a deeper analysis of the length of each campaign showed that the duration of two of the four campaigns intended, at least on paper, to collect pertinent feedback was clearly insufficient to achieve this goal (the Public Service Platform campaign lasted 6 days; and the OGP Principles just 19) and, therefore, the fact that they asked for proposals was not enough to make the policy process more participatory. The scarcity of pertinent contributions on the official website is coherent with the existence of these barriers.

4.3. Application of the deliberation criteria

The application of the deliberation criteria to the nation-wide Urna de Cristal projects in 2017 shows that there is practically no evidence of any intention of the Colombian government of making the policy process more deliberative. Firstly, the government did not carry out any Influence campaign at the national level. This was also the tendency at the local level – amongst 20 campaigns, there were 15 Education campaigns, 5 Consultation campaigns and none Influence campaign.

Secondly, the Colombian government was clearly reluctant to include citizen feedback in the design of new policies. The subject matter of 10 of the 17 campaigns was a policy *already* designed or implemented – the only intention of the government would have been to inform citizens of the potential benefits of such policies. The new Accountability Handbook campaign, for instance, was framed as a consultation project, but its only purpose was to promote the new government guidelines on this issue. The government only sought for some form of citizen collaboration in three cases: i) the development of the Justice Strategy 2017-2020, ii) the passing of new regulation on animal abuse, and iii) the creation of a platform for supervising public service delivery. However, as the analysis of the participation criteria showed, people's opportunities to provide feedback on these policies were severely constrained. From the remaining four campaigns, two were used to help the government to implement a policy (Colombians Abroad and School Meals) and the other two were not even related to specific policies – one was a case of crisis management (Mocoa Landslide) and the other a "commemoration" project (Women's Day).

The evidence suggests that the Colombian government had very limited intentions of rendering the policy process more deliberative. There were no influence campaigns in 2017, only three campaigns embraced policies in the process of being designed, and one of these related to public service delivery and lasted less than a week. All of this leads to call into question the nature of Urna de Cristal as an e-participation scheme – the programme looked more like a communication strategy during the year studied. Actually, from the 10 campaigns on policies already designed or implemented, two of them had the clear intention of increasing government's domestic legitimacy. This is the case of the campaign aiming at promoting the principles of the Open Government Partnership and, obviously, of the campaign to inform the achievements of the government regarding transportation, education, security and anti-corruption (Colombia Wins). Similarly, the campaigns on Housing Schemes, the Accountability Handbook, and the e-Consultation Handbook were intended to share with the general public "positive" measures the government had already taken.

5. Conclusion

The literature review allowed us to draw two preliminary conclusions (see Section 2.3.). Firstly, in normal circumstances, political authorities would not have many incentives to make the policy process more democratic, this is, more inclusive, participatory or deliberative. Secondly, politics would not only affect how technological solutions are deployed but would also be embedded into them — an open government data portal containing JSON and CVS files would reflect the political intention of opening government and creating spaces of public-private collaboration, while a similar portal that only shares PDF files would not reflect such motivations. Therefore, it should be expected that, in normal circumstances, the enactment of technology-enabled participation projects will prevent these schemes from making the policy process more inclusive, participatory or deliberative.

The objective of this work was to determine if these preliminary conclusions drawn from the literature held true in the case of Colombia's Urna de Cristal, a multimedia e-participation scheme composed of a variety of projects (commonly known as "campaigns") run by the Ministry of Information and Communications Technology. With this aim, a series of criteria were drawn and adapted from a multi-dimensional framework for the evaluation of centralized cross-platform approaches to social media exploitation by government agencies developed elsewhere. Then, these criteria — inclusion, participation, and deliberation — were applied to the nation-wide projects implemented under the umbrella of this scheme during 2017.

The evidence analysed suggested that the Colombian government had scant political incentives to make the policy process more democratic during the implementation of Urna de Cristal. Indeed, there is little evidence of any intention of rendering the policy process more participatory or deliberative – there were limited chances for people to provide feedback, information campaigns were disguised as consultation campaigns, the reception of proposals was generally centralised on an official website, most of the campaigns dealt with policies already designed, a couple of them tried to legitimise the work of the government, and a none influence campaign was implemented at local and national levels. Nevertheless, some data suggested that there was an intention of making the policy process more inclusive. Although this evidence is not conclusive, this might be coherent with the framing of this e-participation scheme as a communication strategy. Thus, the Colombian government would have been willing to keep people informed of certain issues, namely of policies already implemented, but it would have also prevented them from providing feedback and influencing decision making. This may be used as a working assumption in future academic studies or policy evaluations of this scheme.

This case study has, of course, certain limitations. First, a more comprehensive assessment may be required – this work only examined one of the years that Urna de Cristal has been in place, and did not take into account local campaigns. Second, this case study may be complemented by a more in-depth qualitative analysis. For instance, the deliberation criteria could be better applied if politicians, public servants, and even citizens were interviewed, or policy outputs were compared to citizen proposals. Third, the use of more rigorous quantitative methods may help to build stronger conclusions with regards to the inclusion criteria. Fourth, alternative explanations should be explored as well. Maybe Urna de Cristal does not have the capacity to implement campaigns that make policy making more inclusive, participatory or deliberative; maybe the official data available online is not reflecting the internal (or even invisible) work of the team in charge of implementing each campaign; or maybe these civil servants did not have the experience, skills or training required to deploy large-scale e-participation projects.

However, despite these limitations, the findings of this work are consistent with the proposition according to which the lack of political incentives to make the policy process more democratic is likely to be embedded into the enactment of technology. Indeed, the social media platforms, messaging services, and webpages utilised by the Colombian government to implement e-participation projects in 2017 at the national level largely reflected their intention of preventing the public from participating and having influence on the policy process. This interplay between platforms, social media, policy status, government intentions, types of campaign, and other inputs should not be disregarded in future research on e-participation and e-democracy.

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Improving Monitoring and Evaluation in the Civic Tech Ecosystem: Developing Theories of Change to Support Future Contribution Analysis

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For nearly a decade, civic tech stakeholders have been creating technology supported solutions to civic challenges. Globally, the civic tech movement is rapidly professionalizing but has limited documented evidence of successes and challenges. Comprehensive monitoring and evaluation in the civic tech ecosystem are necessary to create a foundation of knowledge for future initiatives. Monitoring plays a key role in improving services, pivoting approaches, and guiding more efficient resource allocation. Evaluation highlights what is working, what is not working, and critically, why? In a sector that merges data, design, and technology with user-centred principles, monitoring and evaluation in the civic tech ecosystem has several inherent challenges. This paper suggests that a theory-based evaluation approach called Contribution Analysis has the necessary sophistication and agility to support comprehensive monitoring and evaluation to support the growth and sustainability of the movement. This paper applies the early steps of contribution analysis to two Canadian civic tech projects to demonstrate its feasibility.

Keywords: civic tech, evaluation, monitoring, digital government

1. Introduction

The rapid growth of global interest in civic-focused technology (civic tech) throughout the previous decade can be partially attributed to the convergence of increasing public interest in democratic processes, emerging digital technologies, and ongoing government reforms. Government and civil society efforts to increase transparency, accountability and participation through e-government, government 2.0, open data and open government movements provide a conducive environment for civic tech to flourish. Beginning as a series of volunteer, ad hoc efforts and hackathons in the United States and the United Kingdom, civic tech has evolved over the past decade into a global movement. Community civic tech groups modelled after the Code for America brigades across the United States are part of a larger ecosystem that includes government, community organizations, non-profit organizations, private and social enterprise, academia, and residents (McNutt, 2016). Actors within the civic tech ecosystem employ technology-supported products and processes to address civic issues of concern in communities. The driving goal from the beginning was, "to make government at all levels, more responsive to constituents, more judicious in its use of technology, and less apt to squander taxpayer dollars on failed procurement" (Harrell, 2018:1). Advocates suggest that the civic tech movement could lead to a 'revolution' in government accountability and transparency by changing the way that governments and residents co-produce solutions to civic challenges (McNutt, et al., 2016).

Given the cross-disciplinary nature of civic tech within academia, the scholarly research on the tangible benefits is often buried within diverse disciplines, using discipline-specific language leading to pervasive questions about how to comprehensively evaluate civic tech approaches. This highlights an opportunity to test new monitoring and evaluation approaches that assess how civic tech initiatives make a difference in public challenges. Noveck (2015:144) states, "the first step toward implementing smarter governance... is to develop an agenda for research and experimentation..." Civic tech at its core is about developing smarter governance through combining internal and external knowledge, skills, and experience to tackle complex challenges. Relevant literature strongly emphasize that evaluation needs to be a collaborative process and embedded within initiatives in the ideation stage rather than post-facto (Boyd et al, 2004; Patton, 2006; 2011).

Several important questions can be answered by having comprehensive monitoring and evaluation embedded in civic tech initiatives: How well is a particular civic tech platform or approach working? Did the initiative have direct influence in the change occurring? Are the tangible changes made through the initiative sufficient given the resources invested? There are inherent challenges to monitoring and evaluating within the civic tech ecosystem and the approach needs to be sophisticated enough to adapt to mid-initiative iterations. Currently, these challenges often lead to a to focus on low-hanging fruit like gathering metrics for website hits, clicks, or other forms of digital interactions, and shy away from the complexity of more substantive evaluation. Improving monitoring and evaluation in the civic tech ecosystem is a part of a maturing process necessary to empower people and organizations to be ambitious, do their best work, and consistently strive to do better.

Theory-based approaches to monitoring and evaluation are adept at explaining impact mechanisms in situations where counterfactual-based methods are inappropriate or ill-suited (Delahais, & Toulemonde, 2012). This paper proposes a theory-based evaluation framework called Contribution Analysis as an adequately sophisticated approach to address the complexity of monitoring and evaluation in the civic tech ecosystem. Contribution analysis uses a theory of change that combines a results chain with assumptions about the necessary conditions for the results to be achieved. The goal of this paper is to explore the applicability of contribution analysis to civic tech and provide an example of applying its early stages to relevant projects in Canada.

In the following four subsections: the paper briefly explores the ongoing efforts to define civic tech globally; reviews existing literature on civic tech initiatives and discusses the challenges that limit effective monitoring and evaluation and the importance of addressing those challenges. The paper then introduces two civic tech initiatives in Canada and demonstrates how contribution analysis can be applied in distinct contexts. It continues with a discussion on how contribution analysis

can address civic tech challenges through the lens of the previously mentioned examples and finally, provides concluding thoughts.

2. Defining Civic Tech

Civic tech lacks a universally accepted definition, but there are few points of contention within existing attempts and the divergence is largely found in perspective, scope, and stakeholders (Gilman, 2017).¹ Literature describes civic tech broadly as a "convergence of fields" or a "system" that includes community organizing, social networking, opening data, participatory or collaborative governance that makes use of emerging digital technologies, and resident-to-resident collaboration (Patel et al., 2013;6; McNutt et al., 2016). Its emergence has interdependencies with e-government (Armstrong, 2010), government 2.0 (Uppstrom, & Lonn, 2013), open government (McNutt et al., 2016), open data (Robinson & Johnson, 2016), smart cities (Chatwin & Arku, 2019), and evidence-based policy and practice reforms (McGann, Blomkamp, & Lewis, 2018). The interdependence of civic tech and these fields is reflected in the commonality of the language used to describe them. For example, the International Data Corporation defines civic tech in this way, "Using civic applications, open data platforms, and a range of other technologies, civic tech connects citizens, tourists, and businesses with government services and government workers to make civic engagement and government infrastructure more effective" (2014).

While some definitions primarily focus on technology; including open data, social media, apps, and websites, most recognize the social and relational aspects as intrinsic components of civic tech (Knight Foundation, 2015; Living City, 2012; Purpose, 2016). McNutt et al. (2016:154) state, "It is the social-technology dimension of civic technology that potentially represents the most significant change to established institutions and techniques of local governance." The civic tech ecosystem cannot be reduced to technology mediated interactions between government and public. Gilman (2017) aptly states, "Civic tech used for governance is less focused on finding the next "killer app" than on employing technology in order to achieve more responsive and inclusive governance." In this way, data, design, and technology are a means to an end, tools rather than strategies or end-states (Wilson, & Linders, 2011). At its core, it is a social intervention movement aimed at using data, design, and technology to reinvent government and community relations and rebuild trust (McNutt, et al., 2016). An emerging theme in civic tech is the equipping of individuals, groups, and organizations outside of government to re-establish the power of their collective voice in decision-making (Sifry, 2014). To this end, the oft repeated mantra is that civic tech stakeholders "build with, not for" communities to deliver more contextually appropriate and sustainable solutions (McCann, 2015).

The divergence in civic tech definitions is most evident when exploring its boundaries, including which stakeholders are included in the ecosystem. For example, a Microsoft vice president suggests,

¹ For a comprehensive summary of ongoing discussions amongst civic tech practitioners about the role and connectedness of the public, the depth and impact of participation, the type and focus of organizations in relation to power and decision-making, and the level of tech-enabled empowerment of individuals see Sifry (2014)

"Broadly defined, civic tech ranges from engagement between the city government and its population on social platforms, *all the way to enterprise solutions that offer deep government IT problem-solving*" (Microsoft, 2014, *emphasis added*). While there is broad agreement that civic tech includes technology mediated interaction between government and residents, Microsoft's inclusion of government technology and the upgrading of legacy systems in their definition is contentious. Many practitioners insist that legacy systems are 'gov tech' and suggest this is a distinct field from civic tech. For example, a report co-authored by The Knight Foundation and Rita Allen Foundation (2017), suggests that 'gov tech' only becomes civic tech when it is focused on the intended outcome of addressing civic challenges in collaboration with residents. In other words, government technology for the sake of internal efficiency is not civic tech, but technology employed by the government to engage residents would fall within this definition of civic tech.

A second point of contention is The Knight Foundation's infamous inclusion of for-profit entities in the sharing economy such as Airbnb and Lyft into their accounting for investment in civic tech in the United States (2013). The inclusion of private companies from the sharing economy aligns with The Knight Foundation's definition of using technology to enhance how people interact with each other and with the broad definition of civic tech proposed by the Civic Tech Field Guide where civic tech is using technology for the public good (The Knight Foundation, 2013; Civic Tech Field Guide, N.D.). In contrast, organizations like Women in Civic Tech, and the International Data Corporation and definitions in literature, suggest that the absence of a civic challenge in private entities in the sharing economy excludes them from the boundaries of the civic tech ecosystem (Harding et al., 2015; Rumbul, 2016; Gilman, 2017).

While there are inherent risks in permitting undefined parameters for a field of practice, it also allows for creativity and innovation. Articulating a definition is primarily beneficial as a means to an end; if it helps to connect to ideas, people, and resources. This paper proposes a definition of civic tech that includes an ecosystem of stakeholders and centres the use of boundary spanning data, design and technology to support the interaction of democratic institutions with their constituents (McNutt, et al., 2016; Gilman, 2017; Lukensmeyer, 2017). For the purposes of this paper, we define civic tech as a process that uses data, design, and technology to inform, engage and connect residents with government and/or each other to advance civic outcomes. The stakeholders in this ecosystem include public facing digital government institutions, academia and non-profit intermediaries, civic focused private institutions and start-ups and residents engaged in civic participation (See Figure 1). The primary purpose of this definition is to ground forthcoming discussions of monitoring and evaluation approaches in a common understanding of the civic tech ecosystem.



Figure 1: Civic tech ecosystem. Source: authors.

3. Civic Tech: A review of the monitoring, evaluation, and research literature

Though civic tech is now widely recognized in literature and practice as a distinct field, monitoring and evaluation in its ecosystem is still largely experimental and a relatively new area of study (McNutt, et al., 2016). While the field of civic tech has a lot to learn from adjacent disciplines, the literature reviewed for this paper was limited to scholarship that identified as a being a part of the civic tech ecosystem. Civic tech literature can be broadly grouped into three categories; analysis of secondary data to understand participant demographics of specific platforms, how civic tech intersects with other distinct fields of practice and conceptual frameworks, and the evaluating of the efficacy of civic tech interventions.

Much of the existing civic tech literature aims to answer research questions using secondary data rather than exploring the efficacy of programs through primary data. The distinction lies in the literature's focus on who participated in specific platforms, rather than what made these platforms or processes effective (or not). While there is overlap between research and evaluation, research asks different types of questions that may not relate to the understanding of outcomes or context. For example, in a post-hoc evaluation of a civic action site, E-Democracy.org, used external public data sets to supplement user demographic data to explore the participation of women and people of colour (Lopez, & Farzan, 2017). The study attempted to demonstrate how to overcome a lack of demographic data because many civic action sites do not collect information about gender and race. This approach answers important research questions, but it does not directly attempt to assess the efficacy of the platform. The second predominant section of literature explores civic tech in relation to a diverse set of theoretical frameworks from different disciplines. As an example, Gilman (2017) discusses how civic tech fits into a paradigm of collaborative or networked governance. Rather than delve into civic tech initiatives, the paper predominantly focuses on how to leverage civic focused technology for collaborative government services and effect change on the traditional relationship between government and the public. Similarly, a study from a human-computer interaction (HCI) frame examined the development of trust and relationships between residents and civic authorities using an empirical participatory design process to provide pragmatic considerations for addressing mistrust inherent in the use of technology mediated crowdsourcing (Harding et al., 2015). There is a large quantum of civic tech related research that is buried within distinct disciplines that is not currently being accessed by practitioners.

The third, and most applicable, section of civic tech literature uses different tools and methodologies to examine the outcome and impact of interventions. This includes practitioner and philanthropic case studies and a limited number of scholarly contributions. For example, Code for America published a case study that documents the formation of Code for the Caribbean Fellowship program (Code for America, 2014). The case study is a comprehensive review of the process of establishing a Fellowship program but includes limited discussion on the approach to monitoring and evaluation. This case study is one example of many provided by the Code for All network, including Code for Canada's early reporting.² Similarly, in 2015 the Knight Foundation published a review of numerous civic tech case studies, identifying metrics and indicators used to evaluate success (Knight Foundation, 2015). While this is one of the most comprehensive reviews of civic tech projects, its metrics are primarily quantitative counts of qualitative features and largely absent of any analysis of behaviour change, capacity building or exploration of the necessary conditions that facilitated the desired change.

In contrast, a study on the impact of civic action sites (ie. UK-based mySociety) specifically assesses initiatives in the civic tech ecosystem (Cantijoch, & Galandini, 2016). The evaluators gather unique qualitative and quantitative data to address the question of whether the websites contribute to 'community efficacy'- defined as the belief that as a resident, one can make a difference in the area in which they live. This study takes an innovative approach by applying a mixed-method research design that studies individuals' civic and political activities inside and outside of the site over a 3month period (Cantijoch, & Galandini, 2016). A similar study explored how, and to what extent, tech solutions and the process that produced them, make relevant parts of the local government more responsive to participation by low-income young adults (Network Impact, 2016). An analysis of Community PlanIT and Public Agenda combined analysis of platform data, including user demographics, with interviews with game players and developers (Network Impact, 2016). The evaluation focused on whether their game facilitated meaningful engagement and how the processes in the game helped or hindered deliberation and decision-making. Additional literature highlights research on the impact of neighbourhood scale technology to support civic engagement (Taylor, et al.,

² See <u>https://codeforall.org/resources</u>

2018), a sociotechnical exploration of how the failure to consider organizational forms and institutional arrangements leads to poor results in e-participation initiatives (Harding, et al., 2018), the challenges with crowd-sourcing civic solutions (Uppstrom, & Lonn, 2013; May, & Ross, 2018), and technology-enabled changes in political participation in the last decade (McNutt et al., 2016). Our paper aims to provide practitioners with the tools to contribute to this body of literature through the application of a theory-based approach to monitoring and evaluating civic tech initiatives.

3.1. What are the challenges to effective monitoring and evaluation in the civic tech ecosystem??

Demonstrating how interventions lead to the desired change, is difficult in any sector, and civic tech is no different. Evaluators suggest that social change work is akin to a complex and dynamic network of nonlinear and interdependent cause-effect relationships (White, 2010; Dybdal, et al., 2011; Chatwin, & Arku, 2019). The arguments regarding the attribution challenge are well-documented elsewhere³, but evaluators are beginning to acknowledge that despite the methodological strengths of counterfactual designs, holding them up as the gold standard in all circumstances is not appropriate or optimal (Cook et al., 2010; Deaton, 2019). Mayne agrees stating, "in complex systems, experimenting with exogenous variables is not possible or not practical: the counterfactual case cannot be established" (2011:4). This is especially true in the civic tech ecosystem where collaboration, iteration, and adaptation are intrinsic features of the sector.

The literature on the civic tech movement highlights several key challenges to effective monitoring and evaluation that stakeholders will need to address. The first oft cited challenge is a lack of resources and capacity; there are limited options to directly fund robust data collection and analysis of outcomes and impact (Dybdal, et al., 2011; The Knight Foundation and Rita Allen Foundation, 2017). Frequently, evaluation is not within the mandate of project leaders and initiatives are operating as start-ups with limited organizational capacity (Sturgill, 2019). Additionally, civic tech initiatives are faced with the challenge of emerging outcomes and undefined long-term changes. While the overarching goals are often clear from the beginning, the changes that result from initiatives are fluid and iterative in response to new learning, changing context and other external factors (Kane, et al., 2017). Further, the actions taken in the short-term may be in service to outcomes and changes that are imperceptible within the timeframe of a typical project, especially philanthropically funded initiatives (Kane, et al., 2017; Sturgill, 2019).

Civic tech is by nature a collaborative and user-centred process. It often involves product development and capacity building working in concert to address presenting challenges. The complexity of initiatives makes it difficult to segment what aspects are working and whether the efforts of individuals and organizations are the direct cause of the change (Koleros, & Mayne, 2019). The complexity of the challenges often requires multiple stakeholders working collaboratively on different components. This leads to difficulty in isolating the direct effect of a singular intervention or attributing change to any one partner within a multi-faceted program (Kane, et al., 2017). Further, interventions

³ See Dybdal, et al, 2011; Cook, et al., 2010; White, 2010)

often target multiple beneficiaries with some being the recipient of capacity building and some benefiting from improved direct service. Within an intervention there are distinct activities aimed at different actors (Koleros, & Mayne, 2017). Those interventions aimed at end-users need to be sensitive about collecting and using demographic data in evaluations. Given the sensitivity of the users, often collecting this data is not appropriate and proxies must be used instead (Lopez, & Farzan, 2017). Finally, monitoring and evaluation in the civic tech ecosystem is challenged by a lack of trust amongst the stakeholders. This results in reduced transparency in outcome monitoring by government and apathy or adversarial approaches by the public (Harding, et al., 2015).

3.2. Why is robust monitoring and evaluation important in the civic tech ecosystem?

Civic tech as a sector has primarily focused on hoped-for-benefits rather than engaging in rigorous monitoring and evaluation (McNutt, et al., 2016). May and Ross (2018) suggest that the dearth of studies assessing the impact of civic tech, from a methodological and outcomes perspective, leads to unanswered questions about the immediate and longer-term impacts of civic tech. The potential of civic tech to improve the relationship between government and the public is compelling, but the shortcomings, failures of technology and overreach of government focused technology companies cannot be ignored. Sturgill (2019) argues, a more robust evidence base is required to demonstrate the cultural change that stakeholders desire to catalyze within government and communities. Organizations embarking on digital transformation of civic facing processes benefit from understanding where to prioritize investments and how to measure the true value of data, design, and technology (Fernandez-Olano, et al. 2015; Gottlieb, & Willmott, 2014). Further, clear evidence of 'success' over time is critical to attract and retain investors, clients, and government or philanthropic contributions. Ongoing budget constraints and scrutiny result in a desire for robust evaluation with a heightened focus on outcomes and impact. Impact Canada acknowledges, "We are aware that program spending is an investment that we are making on behalf of, and directly for Canadians, and we need to place greater emphasis on understanding what differences these investments make in improving the lives of citizens" (2019:iii).

While the importance of robust evaluation is evident for efforts external to government, there is an equivalent importance for civic facing technology within government. Innovations in governance are occurring rapidly resulting in a lack of accumulated knowledge about what works and what does not (Clarke, 2019). Governments are increasingly turning to Key Performance Indicators (KPIs) to 'measure' their digital work. While KPIs hold value for monitoring performance, without being embedded in a larger story that focuses on affecting the desired change, their utility is limited when trying to understand why initiatives are working or not (Kotarba, 2017). Similarly, public facing digital technologies are increasingly provided by organizations external to government. While this challenge extends beyond the civic tech ecosystem and into the 'gov tech' field, it highlights the necessity of comprehensive evaluation as a norm for government digital procurement. The knowledge gaps that lead to government looking for external solutions is making them vulnerable to poor services and getting locked into waterfall development processes and long-term legacy contracts (Clarke, 2019). Recently, governments have begun to test more agile procurement processes with smaller technology companies and civic tech communities, providing an opportunity for earlyimplemented and ongoing evaluation of externally created products⁴. Governments turning to external stakeholders must learn to be 'smart shoppers' and build their in-house knowledge through comprehensive evaluations of procured services (Morozov, 2016; Clarke, 2019).

Broadly, the importance of monitoring and evaluation for civic tech is in its ability to generate findings that can be used for learning and better decision-making by all stakeholders in the ecosystem and to demonstrate their contribution to improved civic outcomes.

4. What is Contribution Analysis?

Contribution analysis is a theory-based evaluation approach designed for complex initiatives. The evolution of the model has been outlined in numerous articles and working papers produced by the author of the approach, John Mayne (see: 2001, 2008, 2011, 2012, 2015, 2017, 2018, 2019). There is a substantial amount of writing on its components and using it as a framework for strengthening the confidence and conclusiveness of theory-based evaluations (Rogers, 2008; White, 2009; Toulemonde et al., 2011; Delahais, & Toulemonde, 2012; Befani, & Mayne, 2014; Koleros, & Mayne, 2019).

Contribution analysis is an iterative approach that begins with what is known at the time and gathers evidence of what has changed, adapting, and evolving the theory of change to increase confidence that the initiative is creating the desired outcomes. In this way, contribution analysis can be compared to the hypothetico-deductive method employed by physicists; it is the making and checking of evidence-based predictions. Determining causation does not come from any singular study, it is through triangulation and the totality of the evidence that leads to confidence in a verdict of contribution or causality (Spears, Ban, & Cumming, 2020). Contribution analysis seeks to verify a model of how the intervention's activities are expected to lead to the desired aims of the initiative, its theory of change (ToC). The ToC shows the anticipated progression from activities to desired long-term change and outlines the causal links and contribution story or stories involved. That is, contribution analysis seeks to tell an evidence-based story about how changes have occurred and what role the intervention played in their realization.

While civic tech is predominantly known for its innovative uses of technology to address challenges, it is equally focused on building capacity and changing behaviours of all stakeholders. There is considerable research in evaluating behaviour change that can be utilized for civic tech. For example, based on a review of a current social science research Michie, van Stralen, & West (2011) proposed the COM-B model of behaviour change which is based on the assumption that behaviour (B) occurs as the result of interactions between capabilities (C), opportunities (O) and motivation (M):

Capability: The individual's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills.

⁴ See https://open.canada.ca/en/blog/agile-procurement-better-digital-solutions

Opportunity: All the factors that lie outside the individual which make the behaviour possible or prompt it.

Motivation: All those brain processes that energize and direct behaviour, not just goals and conscious decision-making. It includes habitual processes, emotional responding, as well as analytical decision-making.

Mayne (2018) incorporated this model into contribution analysis, developing the COM-B ToC model (See Figure 2) and demonstrated its applicability to a wide variety of interventions. The approach centers on the development of a robust ToC that posits the pathways of contribution that provide varying levels of confidence that an initiative is leading to the desired results.



Figure 2: COM-B Theory of Change

To clearly understand the ToC used in contribution analysis requires a brief review of the terms and their definitions in this context (Mayne, 2015)⁵:

⁵ There is no universal understanding or definition of these terms, these definitions outline how the terms are used in the context of CA and in this paper.
- **Impact pathways:** Also referred to as a results chain, the impact pathways display the causal pathways showing the linkages between a sequence of steps in getting from Activities and Outputs to Capacity Changes, Behaviour Changes, Immediate Benefits, and the Long-Term Change (See the white boxes in Figure 2).
- **Causal link assumptions:** The events or conditions necessary or likely necessary for a particular causal link in a ToC pathway to be realized beginning with the Reach and Reaction Assumptions to the Capacity Change Assumptions, Behaviour Change Assumptions, Immediate Benefit Assumptions and the Long-Term Change Assumptions (See the shaded boxes in Figure 2).
- **Theory of Change:** A combination of the impact pathways and the causal link assumptions with the timeline and external influences identified.

Contribution analysis is designed to answer questions such as: Did the intervention(s) contribute to the desired change in organizational capacity and behaviour change over the intervention period? How did these changes occur? What external influences were involved in the change?

The general steps in Contribution Analysis are as follows (Mayne, 2011):

- **Step 1:** Identify the problem or challenge, and articulate the desired results and contribution questions to be addressed
- **Step 2:** Collaboratively develop robust theories of change for the intervention, including the assumptions about the necessary conditions required to affect change
- **Step 3:** Gather existing evidence on the components of the theory of change model of causality:
- The results achieved
- The causal link assumptions realized
- Step 4: Assemble and assess the resulting contribution claim, and the challenges to it
- **Step 5:** Seek out additional evidence to strengthen the contribution claim and identify external influences
- Step 6: Revise and strengthen the contribution claim, compose the contribution story
- Step 7: Return to Step four, as necessary

This article focuses on completing steps 1 and 2 to set the stage for developing a contribution analysis monitoring and evaluation plan in the civic tech ecosystem. Initiatives of all scales within diverse contexts benefit from a well-crafted theory of change even if they do not apply the contribution analysis approach. This also creates a foundation for future research to assess the full application of contribution analysis in diverse contexts. The contribution analysis steps are set out in a linear sequence, but in practice there are numerous iterations among them. This is particularly true for complex interventions involving a number of actors and components, as is usually the case for civic tech projects. In these cases, developing a single ToC that tries to lay out the details of the intervention is likely not practical or evaluable. To clarify the interconnectedness and complexity, it is often useful to first set out an Overview ToC showing the big picture and the major pathways to long-term change and then to develop more evaluable nested ToCs showing how the various causal factors are working to bring about the intended impacts (Mayne 2015). These less complicated nested

ToCs are considerably more amenable to a contribution analysis, clearly identifying the various contribution stories involved. They also then allow for more specific evaluation questions to be identified (back to Step 1).

5. Applying Contribution Analysis to Civic Tech

Due to capacity and resource constraints, stakeholders in the civic tech ecosystem have to make decisions about the level of resources to apply to monitoring and evaluation. For small-scale community-based initiatives without sufficient funding, the early development of a ToC provides numerous benefits and requires limited ongoing resources. First, creating a COM-B ToC compels stakeholders to grapple with their rationale, assumptions, and underlying beliefs, and creates a foundation that can be built on at later stages of program maturity or funding. Second, it provides rigour in thinking critically about the necessary conditions for core activities and their interactions with other influences within a complex and dynamic environment (Kane, et. al., 2017). These potential factors include organizations working towards the same goal, or barriers that emerge due to changing socio-political conditions As noted, one significant strength of the approach is its ability to untangle activities and results in a way that explicitly examines multiple actors and influences in change-making initiatives (Kane, et al., 2017). This untangling begins with the early iterations of a COM-B ToC.

The utility of contribution analysis to the civic tech ecosystem is best assessed by examining its application to existing projects. This paper selected two distinct projects out of the many digital change-making initiatives in Canada in an attempt to highlight its adaptability to different stakeholders, scale, and intent. The first example, a Fellowship program from Code for Canada, highlights a digital product-led capacity building intervention from an intermediary (See Figure 1) with numerous activities aimed at accelerating digital transformation within government. The second example, a web-based platform from BetaCity YEG, a community civic tech group in Edmonton, highlights a grassroots approach to ensuring people access the services they need while concurrently changing the way local government interacts with the tech community. Given the broad scope of initiatives that exist within the civic tech ecosystem, these examples are not considered fully representative. However, they serve as two distinct projects that can highlight the applicability of contribution analysis.

5.1. Example #1- Code for Canada Fellowship

Code for Canada (C4C) is a national non-profit that supports governments and communities in Canada to harness the power of digital technologies through connecting government innovators with people, knowledge and skills from the data, design, and technology sectors. Functionally, C4C acts as an intermediary in the space between government and the public to facilitate technology assisted solutions to usability and engagement challenges (See Figure 1). The flagship program is a Fellowship that embeds technology and design professionals within government teams at the municipal, provincial, and federal levels. It is a response to the gap between governments enthusiasm for digital innovation and their lack of capacity to lead these government reforms (Clarke, 2019).

The ongoing evaluation of the Fellowship aims to answer the following questions for Code for Canada, government partners, and other stakeholders:

- Did the Fellowship contribute to changes in government partner capacity (capability, motivation, opportunity) to incorporate modern digital tools and processes, leading to more effective delivery in their service area?
- Did the increase in government partner capacity impact the ability of users to find/access the desired public service?
- What were the key factors that contributed to/limited these changes?

With government partners and fellows, C4C co-developed and applied a three-story nested program COM-B ToC, to guide the monitoring and evaluation of the effects of the Fellowship program on product delivery and capacity building (See Figure 3).



Figure 3: Code for Canada Fellowship Theory of Change Overview

Given the complexity of the Fellowship program, it was important to segment it into evaluable 'stories' or areas of focus. Figure 2 is a high-level look at how the nested ToC's, identified as Stories 1, 2, and 3, interact within the Fellowship program. Each story represents a detailed and evaluable ToC (described below and visually shown in Figures 3, 4, and 5). The approach of using nested ToC's segments the complexity of the Fellowship program and provides a clear evaluation focus for each

stage and actor group involved. The interactions and dependencies between the stories are highlighted in red in Stories 2 and 3. Developing the nested ToC's provides a basis for agreeing on how the Fellowship program is expected to work and the various results and assumptions about the necessary conditions shown, which informs the development of a monitoring and evaluation plan. Given the resources required, it is unlikely that all results and assumptions shown would be monitored. A key component of developing the M&E plan for the Fellowship is making decisions about where to focus data collection efforts.

5.1.1. Story 1: C4C pre-fellowship preparation

The focus of Story 1 (Figure 4) is on the extensive preparation that C4C engages in to find and prepare appropriate government partners, scope the presenting challenge(s) into a feasible project and recruit, assess, hire and train highly qualified fellows. The results chain begins with C4C's on-going communication strategy (*Activities*) that aims to engage with potential government partners and potential fellows who are external to government. Government partners (GP) who express interest in participating are assessed on their readiness and resources and supported to develop a clear articulation of their particular challenge. Code for Canada then recruits user-experience researchers, developers, and product managers from the private sector. The results chain ends at having competent and adequately trained Fellows and an adequately prepared government partner (*Outputs*). Progression on this results chain is largely dependent on C4C providing sufficient training to both the Fellows and the government staff, captured as *Output Assumptions* in the causal links.



Figure 4: Code for Canada Fellowship Theory of Change Story 1 (C4C pre-fellowship preparation)

5.1.2. Story 2: Product development and accelerated digital transformation in the government partner

The theme of Story 2 (Figure 5) is twofold; building a product to address a presenting government challenge and using the product development process to accelerate the digital transformation of the

GP. This is a product led process, meaning the capacity and behaviour change occurs through the co-development of a digital product. The development of a specific digital product is a means to achieve this end, but progress towards this change can be achieved without the successful launch of the digital product. The results chain begins with the outputs from Story 1 and progresses into the capabilities, opportunities, and motivations (Capacity Changes). Given the unique situation of each government partner, the capability changes are intentionally left vague. For one partner, user-experience research may be the capability that they need to unlock new behaviours. Alternatively, other partners may benefit from learning how to incorporate agile product development processes into the way they develop products. A feature of the COM-B model is the interplay of the capabilities, opportunities, and motivations. For example, often government reforms focus on building new skills or capabilities. The Fellowship ToC recognizes that if government staff do not have adequate opportunities and motivations to use the new skills, they will not turn into day to day behaviours. The unique characteristics of each context are determined and incorporated into the M&E plan. An example of a necessary condition, or assumption, is that the skills and experience of the fellows translates successfully into the government context. If this assumption does not hold true, there is little chance that the government partner will realize the capacity change desired. In Story 2, the early and ongoing beneficiaries are the staff in the government partner. The ToC is built on early increases in capacity, leading to intermediate changes in behaviour and a conducive environment for improved product development, with the aim of ultimately leading to improved user-experience in the Long-Term Change. This is an example of a singular initiative having multiple beneficiaries, whereby government staffers are the early and intermediary beneficiaries, with a long-term desired impact on residents.



Figure 5: Code for Canada Fellowship Theory of Change Story 2 (GP Product Development and Use)

5.1.3. Story 3: Long-term transformation in the government entity

The focus of Story 3 (Figure 6) is on the proliferation of the digital and user-centred approaches, originating within the GP and spreading to the broader government entity (GE). As the GP builds its capacities and embeds new behaviours into the way it approaches challenges, they are sharing their approach beyond their immediate team and into the adjacent departments, ministries, and agencies. Story 3 begins at the *Behaviour Changes* stage of the ToC and is dependent on the behaviour change from Story 2 being sustained. The results chain in Story 3 moves beyond the immediate government partner and into the larger government entity within which they operate. While some of this change can and should occur during the Fellowship, the ToC highlights that the long-term change desired will require multiple Fellowships or interventions within the government entity. The necessary conditions represented in the *Behaviour Change Assumptions* are bi-directional. The original GP must proactively share their new practices outside of their immediate unit and the adjacent staff begin to observe with interest and pursue their own learning. As with Story 2, the early beneficiaries are internal to government and the intended *Long-Term Change* is the delivery of measurably better services and policy to the public.



Figure 6: Code for Canada Fellowship Theory of Change Story 3 (Long-term digital transformation in GE)

The stories within the ToC serve as a foundation for developing a monitoring and evaluation plan. Specifically, it ensures that all partners have a basic understanding of the goals for the Fellowship and what their respective responsibilities are. Discussions between the stakeholders can illuminate what data is high-priority and what, conditions should be closely monitored for.

5.1.4. Example #2- BetaCity YEG 'YouCanBenefit'

In 2016, the End Poverty Edmonton Task Force, in Edmonton Alberta, recommended that city staff investigate how people can be better supported to access available benefits across all levels of government. The task force recognized that one of the reasons people in need were not applying for services was simply that they did not know what they were eligible for. While there are existing eligibility tools that organizations have for analyzing service eligibility, there are very few organizations that look across different levels of government. BetaCity YEG, Edmonton's community-based civic tech group, suggested to the city that they were well positioned to hire a developer to create a web-based application that equipped users to quickly search all services and resources across levels of government. E4c, a local non-profit organization, responding to a call from a city task force, working with a local non-profit, to develop an application that helps people in need, access services and benefits that they are eligible for. But there are alternative motivations and intentions as well. The City of Edmonton historically has not had a process to enter into contracts with

community organizations like BetaCity YEG. This limits their ability to collaborate on innovative digital responses to meet the emerging needs of their residents. The additional desired benefit of the 'YouCanBenefit' project is to increase the city's ability to enter into new partnerships and create a pathway for small and agile contracts with local technology providers.



Figure 7: BetaCity YEG Theory of Change ("YouCanBenefit" Theory of Change)

For the purposes of this paper, with support from early actors in BetaCity YEG's contribution to the project and available documentation, a representative ToC for 'YouCanBenefit' (Figure 7) was developed. Moving forward, and based on the desires of the community, this ToC could be utilized to develop a retrospective evaluation of the pilot, monitoring and evaluation for the ongoing operation of the platform or as a basis for collaborative development of a nested ToC. The example shown is a composite ToC highlighting two actor groups, e4c and city staff, and could easily be segmented for additional clarity and M&E plan development. One of the key aspects of the results chain is the concurrent *Capacity Changes* within e4c as the user of the platform and the City of Edmonton as the stakeholder responsible for growing and sustaining it. As seen in the Fellowship example (Figure 5), the early beneficiaries are the staff of e4c and the City of Edmonton. The desired *Immediate Benefits* include residents seeking benefits and the relationship between the City of Edmonton and smaller technology organizations. Another critical component of the causal links is the *Behaviour Change Assumption* that the handover of the system from the developer (BetaCity YEG) to the City of Edmonton is successful and the system is maintained by city staff. Success in this transition is not only necessary for the sustainability of the current project, it also impacts the trust the city will place in working with smaller and non-traditional groups for technology development, a stated desire in the *Immediate Benefits*.

6. Discussion and Implications for Practice

While unique in both their approach and implementation, the Fellowship and 'YouCanBenefit' programs face similar challenges in monitoring and evaluation. The challenges inherent in monitoring and evaluating these programs and civic tech more broadly are a feature, rather than a bug, and require an evaluative approach that identifies and adapts to, instead of attempting to isolate and control, its complexity. The C4C Fellowship and the 'YouCanBenefit' programs demonstrate what the early stages of contribution analysis look like, when applied to civic tech initiatives. A limitation of this paper, and an opportunity for future research, is the exclusive focus on early stages of developing COM-B ToC's for contribution analysis. However, the creation of robust ToC's provides a way to develop a common understanding of the intervention and insight into how contribution analysis can support organizations to overcome challenges inherent in monitoring and evaluation within civic tech initiatives. Future research is required to test the efficacy of the approach for evaluating its ability assess long-term change.

The Fellowship program aims to accelerate digital capacity in government partners through the process of co-developing a digital product to address a specific need the government has with their user (users can be both internal government staff or external residents and beneficiaries). Though there is an extensive scoping process that precedes embedding fellows in the government team; the extent of the challenge is not fully known until the user-research and product development begin. While the Fellowship is designed around the development of a digital product, it is fully possible for the product to be incomplete or a complete failure and the Fellowship is still an overall success. As the fellows and their government counterparts embark on the process, they will discover gaps in digital skills, policy and norms, and other barriers. The desired outcomes and impacts of the Fellowship is well underway. Only once the government partner context and may not fully emerge until the Fellowship is well underway and policies become known. The iterative nature of the contribution analysis framework adapts to this reality of emerging outcomes. The ToC is established with the current information and adjusted when new information is learned. The iterations and changes to

the context are all captured within the performance story (Step 6). This transparency allows for external audiences to have a full understanding of the conditions that were necessary for the changes to occur.

The 'YouCanBenefit' project emerged from a group of volunteers from Edmonton's BetaCity YEG civic tech community. The limited resources dedicated to the project were committed to the development of the online platform. One of the key considerations for the 'YouCanBenefit' project was whether it could be done primarily with volunteers and with a very limited budget. This meant that all available funding was directed at the developer with the work being supported by volunteers from the BetaCity YEG community. Evaluating impact was not a priority of the project throughout the inception and design phase. However, as the project was a response to a recommendation from a City of Edmonton task force, there was interest in seeing it continue successfully. Developing an evaluable ToC requires an upfront investment of time but uses limited resources. It can then help in designing the intervention, reaching a shared agreement on how change is expected to occur, and identifying what results would be useful to monitor. If the ToC is comprehensive, then even minimal collecting of early results provides an initial basis for assessing change and contribution.

The Fellowship program is a 10-month agreement between Code for Canada and a government partner. Behaviour change and shifts in norms and policies are not complete within that amount of time. The overarching goal is, sustained change in the relationship between government partners and their end-users. The contribution analysis framework allows for an initial observation of changes made, and exploration of the contributory causes while leaving behind a plausible explanation of how those changes will have a long-term impact on end-users. As Fellowships are completed for more government partners, the legacy theories of change allow for retrospective work at different intervals. Therefore, the ToC is used initially as a program design and observation tool and exists indefinitely as a retrospective tool for desired long-term outcomes and impact.

'YouCanBenefit' has an explicit goal to improve the wellbeing of Edmontonians who require access to government funded programs and services. The pilot project embarked on numerous activities to both address the presenting challenge and improve the way the stakeholders worked together. Initially, it required a volunteer from BetaCity YEG to build an adequate platform so that e4c was better able to serve their clients. This required a focus on capacity building so the volunteers from e4c could use the tool in their day-to-day interactions with beneficiaries. The contribution analysis framework makes explicit all of these distinct activities to enable monitoring (if they occur) and evaluation (what change was made). Further, and perhaps a more distinct advantage of contribution analysis demonstrated in this example is the potential to create nested theories of change that outline, for example, how the 'YouCanBenefit' project was used to build the capacity and change the behaviour of City of Edmonton staff in working with BetaCity YEG and other community entities, to better address community needs.

The Fellowship program operates within an ever-changing political and bureaucratic environment with shifting priorities, resources and supports. Although a frequent, and often fair, critique of government at all levels is that they operate in silos, it is not fully accurate. The government partners of the Fellowship have numerous external influences that impact their work, and their ability to affect change, both directly and indirectly. For example, one of the initial cohorts of the Code for Canada Fellowship was a project with Veterans Affairs Canada⁶. This project benefited from significant leadership and support from the outstanding public servants at the Canadian Digital Services (CDS)⁷. Since contribution analysis is not concerned with isolating and attributing causation to one source, the framework is adaptable to external contributory influences towards shared objectives and impacts. CDS is identified within the ToC as an ongoing external influence for all Fellowship cohorts within the Government of Canada.

Although beyond the scope of this article, the early stages of contribution analysis establish a foundation for determining the level of confidence in an interventions contribution to the desired change, by balancing the optimal methodologically design with the practical limitations and ethical responsibilities (Dybdal, Nielsen, & Lemire, 2011). There is a growing body of literature that focuses on increasing the level of confidence in the causal process through strengthening empirical evidence linking causes and outcomes (Lemire et al., 2012; Schmitt, & Beach, 2015). One frequent approach is using process tracing to study the crucial causal links empirical evidence within-case to increase the confidence in the existence or non-existence of the causal mechanism (Befani, & Mayne, 2015). In process tracing, evidence is a combination of ethnographic data and other factors surfaced during a contextual analysis. This process is not dissimilar to the weighing of evidence in law: observations, statements or artefacts are weighed against known factors of the circumstances, motives, history, and other contextual influences.

An additional method of increasing the level of confidence in the causal claims from contribution analysis is by using it as a part of a mixed-method approach to evaluation, such as when using comparative groups to assess how much change has occurred. For example, in a study on police reform in the Democratic Republic of the Congo, Koleros and Mayne (2019) demonstrate this approach by embedding a quasi-experimental difference-in-difference (DiD) approach within a contribution analysis framework. Nesting the DiD design within a theory-based evaluation is an approach that increases confidence in how interventions influence a desired outcome (Koleros, & Mayne, 2019).

7. Conclusion

As a nascent movement, with limited precedence for comprehensive monitoring and evaluation, it is unsurprising that the civic tech ecosystem, is still seeking appropriate methods. Currently, the stories of impact are largely normative ideals of the benefits of technology to address civic challenges, or quantitative measures, like datasets shared or daily active users. Normative statements or narrow quantitative measures are not conducive to making a compelling case for investment and support of civic tech and digital government initiatives. A more robust evidence base is required to demonstrate the digital, design and technology cultural change that civic tech stakeholders desire

⁶ See https://medium.com/code-for-canada/benefits-at-a-glance-aee020d224f8

⁷ See www.digital.canada.ca

to facilitate within government and communities (Sturgill, 2019). Any method, whether an experimental methodology like randomized control trials or a purely qualitative design, has advantages and drawbacks that are more or less prominent depending on the circumstances within which they are applied (Deaton, 2019).

Contribution analysis is most effective when it is a collaborative process; the ToC is best developed by all relevant stakeholders, including potential beneficiaries when possible. Engaging key stakeholders in the problem identification and solution design is fundamental to the civic tech ethos. Collaborative design of the ToC can ensure a consistent understanding of the challenge to be addressed and help identify gaps and areas with insufficient evidence to validate the contribution claim. This does not mean the process is straightforward or easy. One member of a group from Civic Tech Toronto, in relation to developing a ToC, stated, "…the process was messy and sometimes confusing".⁸ Beginning with a generic ToC model provides stakeholders with a place to begin dialogue on the desired results and existing assumptions. Within a complex, multi-actor environment, it is important to acknowledge the individual, organizational and coalition contributions to the outcomes. Contribution analysis provides a systematic consideration of the influence of each actor (Kane, et al., 2017).

This paper proposes that contribution analysis is an approach that is sufficiently adaptable to address the inherent challenges and to accommodate the M&E needs of the civic tech ecosystem. However, that does not mean that it is without challenges or that it adequately addresses all of the problems inherent in comprehensive monitoring and evaluation. It is important to note that contribution analysis is not a quick and easy approach to addressing causality. Its advantages are that (1) it can be used to make causal inferences when experimental and quasi-experimental designs are not possible, (2) it explores why and how an intervention has influenced change, (3) it allows for making causal inferences about the intervention without necessarily examining external causal factors, and (4) it addresses cases where there are numerous causal factors at work by assessing contributory causes leading to credible contribution claims.

While the paper proposes contribution analysis as a suitable framework for civic tech, it is not without its challenges and limitations. First, building a comprehensive and plausible ToC requires insight, comfort in ambiguity, thoughtful deliberation, and patience. In complex settings such as many civic tech interventions, there is the need to find a way to unpack the program using nested ToCs to be able to highlight key stories about how interventions are affecting different stakeholders, beneficiaries and at what scale. Typically, there is a need for significant primary and secondary data collection. As discussed, collecting data outside of the partner organization to assess the programs impact on beneficiaries is resource intensive. A clear limitation of contribution analysis is that it does not endeavour to estimate the quantitative amount of change brought about by the initiative, rather it explains how the intervention contributes to impacts of interest.

⁸ See <u>https://medium.com/@liamilito/clarifying-impact-lessons-learned-at-civic-tech-toronto-d3d3b85318d7#.6cdsnw297</u>

Despite these challenges, contribution analysis is adaptable to the story that each individual or organization wants to tell, whether that is a story of scaling, degrees of change within a community, or comprehensively addressing one specific civic challenge. It assists in answering the questions; How do we know that civic tech initiatives are succeeding? Did this initiative contribute to the change? The value of contribution analysis is in its systematic and iterative approach to a complex causal problem. It allows initiatives to set broad and aspirational goals without the concern of what they can feasibly achieve in the short-term or prove causation for. It is also not tied to methodological prejudice, rather it provides a framework within which to gather evidence that improves confidence in an initiative's contribution to the desired impact. Contribution analysis adapts to context and with a plausible theory of change, evaluators can decide on which methods best suit their desired outcomes.

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Is Accessibility of Internet Financial Reporting Evolving Towards More Compliance of Disclosure?

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Abstract: Financial transparency is a demand of the community in the current era of information disclosure. Internet Financial Reporting (IFR) through e-government is the most effective media in disseminating information to the public. The purpose of this article is to analyze the effect of financial performance on compliance with financial information disclosure through accessibility of Internet Financial Reporting as moderating. The sample is determined by a purposive sampling technique that requires having e-government and a website that can be accessed until June 2018 and has a Financial Report for 2015-2016. The collected data is analyzed by using Moderated Regression Analysis. The finding is that financial performance (efficiency ratios, effectiveness ratios, routine expenditure ratios and development expenditure ratios) affected the compliance of financial information disclosures. The results of the Moderated Regression Analysis (MRA) also show that IFR accessibility variables are moderating variables between financial performance to compliance with financial information disclosures. This research provides empirical data about the relevance of IFR accessibility evolving towards more compliance of disclosure through e-government websites.

Keywords: regional government, financial performance, accessibility Internet Financial Reporting, financial disclosure

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1. Introduction

Regional governments are public sector organizations that have an obligation to account for the management of funds originating from the community. The public sector organization is required to show a more noteworthy degree of manageability, responsibility and straightforwardness in the utilization of open assets (Elkadi, 2013).

All forms of income and expenditure must be reported transparently to obtain public trust. This form of financial reporting is no longer published in print but through internet-based electronics

known as Internet Financial Reporting (IFR). Regional governments publish their financial statements transparently through the websites of each region starting from the regency / city to the provincial level. Transparency is an expansive idea which is identified with the accessibility of data (supply side of transparency) what's more, the entrance and convenience of this data by residents, and partners (request side of transparency) (Araujo & Romero, 2016).

Instruction of the Minister of Home Affairs No. 188.52 / 1797 / SJ / 2012 have regulated the components that must be reported on the official website of local government in Indonesia. There are many benefits to the existence of the Internet Financial Reporting (IFR). In addition to being efficient in terms of paper use, the existence of IFR also shortens the time and extends the acceptance of financial information to stakeholders widely. Even IFR becomes a medium for financial information disclosure (Khan & Ismail, 2012). In other words, the existence of e-government will improve back-office operations and offer better, efficient and transparent 24/7 services to citizens (Munyoka, 2019).

Achieving government performance efficiency through e-government will increase transparency so that it can promote clean governance. In this way, transparency encourages social orders to improve their administrations' sure commitments while likewise serving to take care of issues intrinsic to government movement (Guillamón et al, 2016).

The success of e-government is determined by many factors. These factors must be known to minimize the failure of implementing e-government, as happened in developing countries (Elkadi, 2013). Several factors that led to the failure of e-government were the prevailing of socio-economic hardships, bad governance and political instability (Munyoka, 2019). What's more, the planning and disclosure of financial information is expensive and it is a fixed expense for association or local government (Bolivar, Munoz & Hernandez, 2013). One of the challenges faced by the government and society is how to build digital (or electronic) access canals that can be effectively used. In determining the type of canal access the ins and outs of technology familiar with the community must be considered. Thus, people's access to digital information determines the effectiveness of e-government implementation in supporting government performance.

One measure of government performance is measured from the financial aspect. Based on the results of previous research, it shows that good financial performance will encourage local governments to disclose financial information to the public (Hiola, Rosidi & Aji, 2016). Ahwan's research, et al. shows that good financial performance will encourage regional governments to disclose financial information to the public (Hadi, Handajani & Putra, 2018). In order for the community to obtain financial information, reliable accessibility is needed. Accessibility in this case, the ease with which to obtain and view financial statements will greatly determine the arrival of this information to the public. There is no research on IFR which makes accessibility as a moderator between financial performance and compliance with financial information, disclosure. With good financial performance and a high level of accessibility, it is expected that regional governments will be more obedient in disclosing their financial information.

Thus, IFR accessibility will provide convenience for stakeholders to obtain financial information. The performance that has been achieved by the government can be displayed and reported through government websites and can be accessed by various layers of society. Therefore, this research will examine the effect of government performance on financial information disclosure, by being moderated by IFR accessibility variables. With this research, it is expected that regional governments can improve the quality of electronic services, so that transparency in regional financial management can also be improved.

2. Research Question

In short, this study seeks to determine the compliance level of financial information disclosure on official government websites. Can the financial performance and accessibility of IFR improve compliance with financial information disclosure, by taking case studies from provincial governments throughout Indonesia?

3. Research Objectives

Overall Objective

• to analyze the effect of financial performance on compliance with financial information disclosure through the accessibility of IFR as a moderator.

Specific Objectives

- to analyze the effect of financial performance on compliance with financial information disclosure.
- to analyze the effect of accessibility of IFR with financial information disclosure.

4. Agency Theory and Signalling Theory

In agency theory, it is stated that there are conflicts between principals and agents in the organization. Agency conflict also occurs in government organizations (Zimmerman, 1997). In this case, the community is the principal who gives its mandate to the government as an agent to achieve welfare goals. Communities will need information to evaluate the course of government. The community will also provide direct supervision on government performance. In this case, Guillamón, M.-D., et al. (2016) also revealed that the use of e-government will bring information closer to the public so that it can reduce agency costs because it is more transparent.

Signaling theory can describe the behavior when two parties (individuals or organizations) have access to different information (Conelly et al, 2011). The government as the bearer of the people's mandate will try to show its success in various programs that have been designed by providing information to the public. The government will give a good signal to the people (Styles & Tennyson, 2007). This good signal is shown by the good performance achieved by the government, so that it will influence community support to the government. Government performance must be informed to the public as accountability as well as a form of promotion in politics (Hilmi & Martani, 2012). Signals in the form of regional government quality information are communicated through the website as well as e-commerce (Mavlanova, Fich & Kaufaris, 2012).

4.1. Financial Performance

Performance is the work result that has been achieved from the implementation of an activity with the aim of achieving the organization's goals, objectives, vision and mission. The performance of public sector organizations can be broken down into various categories, such as financial measures. The financial performance achieved by local governments is a positive signal to get support from the community. Many researches use financial size categories in this research (Hadi, Handajani & Putra, 2018; Hilmi & Martani, 2012; Martani & Lestiani, 2012; Puspita & Martani, 2012; Verawaty, 2015; Mahsun, 2009).

The independence ratio is intended to measure the ability of regional governments to finance the administration of their own government by comparing locally-generated revenue (PAD) with central and provincial government subsidies and regional loans (Wau & Ratmono, 2015).

The independence ratio is calculated by comparing the amount of PAD revenue divided by the amount of transfer income from the central and provincial governments and regional loans. The effectiveness ratio measures the level of output of public sector organizations towards public sector revenue targets (Mahsun, 2009). There are 4 categories of PAD effectiveness levels. Meanwhile, efficiency ratio shows the level of input from public sector organizations to the level of output of the public sector (Mahsun, 2009).

The activity performance ratio is part of the ratio of other legitimate PADs from other total Regional Revenue and Expenditures Budget (APBD). The activity ratio includes the routine expenditure ratio and the development expenditure ratio. The routine expenditure ratio is obtained by comparing the total routine expenditure with the total APBD, while the development expenditure ratio is obtained by comparing the total development expenditure and the total APBD budget.

In previous researches, there are still varied results in terms of testing the effect of financial performance by compliance with disclosure of regional financial information on the internet. results of the Istikomah and Mutmainah research show that the dependency ratio has a negative effect on the publication of regional government financial statements through the internet (Istikomah & Mutmainah, 2017). However, the results of Wau's research show that the regional financial independence ratio has a positive effect on access to financial information on government websites (Wau & Ratmono, 2015). Similarly, the research results by Puspita and Martani which show that regional dependence (DAU) has a positive effect on disclosure of content and disclosure presentations (Puspita & Martani, 2012). However, the ratio of PAD and Regional Expenditures did not affect the disclosure of content, presentation of disclosures and total disclosures on the regional government website (Puspita & Martani, 2012). Based on the signaling theory, it can be hypothesized that local governments with good financial performance will increase compliance with information disclosure as a form of positive signals to get public support.

Hypothesis 1: The independence ratio affects the compliance of financial information disclosures

Hypothesis 2: Effectiveness ratio affects the compliance of financial information disclosures

Hypothesis 3: The Efficiency ratio affects the compliance of financial information disclosures

Hypothesis 4: The routine expenditure ratio affects the compliance of financial information disclosures

Hypothesis 5: The development expenditure ratio affects the compliance of financial information disclosures

4.2. E-Government

According to Reffat, e-government is a transformation of government services to the public which is realized by not only displaying information on sites on the internet (Reffat, 2006). However, services in e-government must reach the transact stage not only by publishing and interacting. When a country has reached the transact stage, a transaction will occur that relates to the transfer of money from one party to another (Indrajit, 2002). For example e-Samsat facility that makes it easy for taxpayers to pay their vehicle tax online. This is a form of Government to Citizens or G2C relations. Government relations with its citizens have proven to be more democratic and transparent through e-government (Chen et al, 2006).

Disclosure of information through internet media (e-government) is the most efficient media in terms of the speed of information dissemination. However, the effectiveness of receiving this information is determined by IFR's accessibility. The easier it is for the public to access information from the internet, the easier it will be for people to evaluate government performance. When the government's performance is very satisfactory, this will have a positive impact to get support from the community. However, the results of the research by Nosihana and Yaya state that Leverage, regional revenue, type of Regional Government and audit opinion have not been proven to influence IFR practices in Regional Government (Nosihana & Yaya, 2016). This proves that not all regions with good financial conditions will provide complete financial information on the official site of the regional government (Nosihana & Yaya, 2016). The results of the Wau research also the financial independence ratio of regional governments had a positive effect on the access of financial information on government websites (Wau & Ratmono, 2015).

Hypothesis 6: IFR accessibility affects the compliance of financial information disclosures

4.3. Internet Financial Reporting Accessibility

As a tool for public accountability, financial statements presented through the internet will bring regional financial management in a more transparent direction. Law No. 14 of 2008 article 9 concerning Public Information Openness becomes the legal protection for disclosure of financial information. Public information in the form of financial statements must be provided and announced periodically in accordance with the instruction of the Minister of Home Affairs of the Republic of Indonesia No. 188-52 / 1797SJ. With high accessibility, it is expected that the community will easily obtain financial information so that it will encourage the government to work more transparently and disclose financial information more fully. Styles and Tennyson state that cities with high income levels will provide financial reports on the internet and accessibility related to financial position (Styles & Tennyson, 2007). Information on financial performance will be easier for the public to accept when there is reliable IFR accessibility. The public can use this financial

information as an evaluation tool for public accountability, so that public support and trust in the government will increase. So that local governments will try to disclose financial information transparently through the internet.

Hypothesis 7: IFR accessibility can moderate the influence of the independence ratio on compliance with disclosure of financial information

Hypothesis 8: IFR accessibility can moderate the effect of effectiveness ratios on compliance with disclosure of financial information

Hypothesis 9: IFR accessibility can moderate the effect of efficiency ratios on compliance with disclosure of financial information

Hypothesis 10: IFR accessibility can moderate the effect of the ratio of routine expenditure on compliance with disclosure of financial information

Hypothesis 11: IFR accessibility can moderate the influence of the development expenditure ratio on compliance with financial information disclosures

5. Methods

This research is a type of quantitative research using data in the form of information from the regional government website and local government financial reports. The population used is all regional governments in Indonesia, amounting to 34 provincial governments. The sampling technique is using purposive sampling. Researchers will take samples with certain conditions or considerations, namely having e-government up to June 2018 and e-government is not in repair (maintenance) and has financial statements for 2015-2016.

The dependent variable in this research is compliance with disclosure of regional government financial information on the website. Disclosure of compliance is based on the scoring index list of the Ministry of Home Affairs, which is based on the Instruction of the Minister of Home Affairs No. 188.52 / 1797 / SJ / 2012. There are 12 documents that must be published in the management of the regional budget. Observation items include transparency content, summary of Work and Budget Plans (RKA) of Regional Work Units (SKPD), Summary of Work and Budget Plans (RKA) of Regional Financial Management Officers (PPKD), Draft on Local Regulation of regional revenue and expenditure budget (APBD), Draft on Amendment of Local Regulation of APBD, Local Regulation of APBD, Local Regulation of APBD Amendment, SKPD's Budget Implementation Document Summary (DPA), PPKD's Budget Implementation Document Summary (DPA), SKPD's Budget Realization Report (LRA), PPKD Budget Realization Report, Regional Government Financial Report (LKPD) which has been audited by the Audit Board of the Republic of Indonesia (BPK) and BPK Opinion on LKPD. The existence of these documents is assessed using a scale of 0 to 2. The number 0 indicates if no document is found, number 1 indicates that the document exists but is incomplete and number 2 indicates that the document exists and is complete. Especially for transparency content using a scale of 0 and 1.

The independent variables in this research are financial performance which includes independence ratios, effectiveness ratios, efficiency ratios, activity ratios which consist of the ratio of routine expenditure to the APBD and the ratio of development expenditure to the APBD (Halim & Damayanti, 2007). Financial ratios can be used as indicators of public sector performance measurement. The use of ratios in determining financial performance is not free from criticism because of weaknesses. As stated by Rusmin et al, the ratio analysis should be accompanied by the right proxy (Rusmin, Astami & Scully, 2014). This inaccuracy can also be caused by differences in the selection of accounting policies that are tailored to the problems in each region with a variety of geographical characters, political status and regional size (Chaney, Mead, Schermann, 2002).

Independence Ratio = Total PAD / Total of transfer revenue of central government + loan

Effectiveness Ratio = revenue target / realization

Efficiency Ratio = cost of PAD collecting / realization of revenue from PAD

Routine Expenditure Ratio = Total Routine Expenditure / APBD Total

Development Expenditure Ratio = total development expenditure / total APBD

The moderating variable in this research is the accessibility of IFR as measured by IFFRACESS in the form of accessibility index value used in the Styles and Tennyson research (2007). Here is the Calculation of Accessibility Index which is the basis for assessing how many steps it takes to find the financial statement in the official website of local government.

Table 1. Calculation of Accessibility Index Value (Source: Styles and Tennyson, 2007)

Point A: +1 point if the official local government website or city a) appears on the first page of Google or Yahoo search by typing the name of the city or region.

b) Presents a summary financial statements in the form of concise tables or concise and easily accessible descriptions

Point B: +1 point if the website a) provides more than one complete file with documents from financial statements

b) Presents a complete and comprehensive financial report component

Point C: +1 point if the financial report a) is in the form of HyperText Markup Language (HTML). b) HTML forms a higher score than pdf format because information is easier and faster to access

Points D: +1 point if the official website a) provides financial information for the previous year. b) IFLGR also presents the previous year's report for comparison

Point E: +1 if the website does not allow us to click more than three clicks to arrive at the previous report as a comparison. This indicates that website visitors gain easy access e.g. IFLGR for the current year which is presented every semester so that it is always updated and on time.

Point F: +1 point if the official website a) provides information to obtain or access copies of financial reports of city or district governments b) Provides analysis tools (for example, Excel's Pivot Table). Pivot Table is a feature of Microsoft Excel that is able to create an interactive table that can display a summary of large amounts of data.

Point G: +1 point if the individual file a) is providing print reports is less than 3MB in size; b) Provides advanced features (such as Intelligent Agent or XBLR implementation).

Point H: +1 point if you have a search engine a) to find the required content or local government financial reports.

b) The search engine on the site can be used to find financial reports.

Point I: +1 point if the official local or city government website a) has a financial report link on the homepage

b) Provides a link to IFLGR on its website.

Point J: +1 point if the official website a) provides contact details that can be contacted either address, telephone number or email address.

b) Provides a question and answer facility or email / phone manager (FAQ)



Figure 1: Research Variable Relationship

In this research, there are three variables, namely Financial Performance, IFR Accessibility and Disclosure Compliance (Figure 1). The independent variable of Financial Performance consists of independence ratio, effectiveness ratio, efficiency ratio, routine expenditure ratio and development expenditure ratio. While the position of the independent variable of IFR accessibility as moderating between the variables of Financial Performance and Compliance Disclosure.

To test the hypothesis, the regression analysis method is used with the moderating variable, namely the interaction test (Moderated Regression Analysis) with the following formula

$$Y = a + b1 X1 + b2 X2 + b3 X1X2 + e$$
(1)

Explanation:

Y : Compliance with financial information disclosures

a : constants

X1 : financial performance

X2: IFR accessibility

In contrast to Wau's research that uses ordinal logistic regression and multiple linear regression methods in testing the factors that influence the availability and accessibility of IFR (Wau & Ratmono, 2015).

Meanwhile, Verawaty's research uses comparative analysis between provincial governments in Indonesia (Verawaty, 2016). Chusna used a regression method to examine the effect of regional government size, regional government financial conditions, level of dependence, regional prosperity, and type of government on the level of disclosure of budget management information (Chusna, 2016).

6. Analysis of Result

To obtain a regression equation that is not biased, the data must be prerequisite to be tested in the form of a normality test and heterocedasticity test. Based on table 2, it can be seen that the magnitude of the Kolmogorov Smirnov value is 1.956 at the 0.001 significance level. This shows that the residual data is normally distributed. The results of this normality test are in accordance with the results of the P-Plot normality test. Based on the spread of the points around the diagonal line and following the direction of the diagonal line, it can be concluded that the residual data is normally distributed (figure 2). So it can be concluded that the regression model has met the normality assumptions.

	Unstandardized
	Residual
Kolmogorov-Smirnov	1.956
Asym.Sig. (2-tailed)	.001

Normal P-P Plot of Regression Standardized Residua

Table 2. Test Result of Kolmogorov Smirnov



Figure 2: Test Result of P-Plot

Heterocedasticity test is used to find out whether in the regression model there is an inequality of variance from one residual observation to another. The Glejser test results in table 3 show that the significance values in the variables in this research are greater than 0.05. With this 5% confidence level, it can be concluded that the regression model in this research does not contain heterocedasticity.

Model	Sig
Independence ratio	.110
Effectiveness ratio	.823
Efficiency ratio	.394
Routine expenditure ratio	.776
Development expenditure ratio	.760
Accesibility IFR	.378
Moderate _ Independence ratio	.112
Moderate _ Effectiveness ratio	.638
Moderate _ Efficiency ratio	.385
Moderate _ Routine expenditure ratio	.942
Moderate _ Development expenditure ratio	.968

Table 3. Heteroscedasticity Test Results (Glejser Test)

Based on table 4, it can be seen that the results of the Anova test or F test are 19.234 with a significance level of 0,000. The significance level that is far below 0.05 indicates that the regression model can be used to predict disclosure compliance. So that it can be concluded that the Financial Performance variable in the form of independence ratio, effectiveness ratio, efficiency ratio, routine expenditure ratio and development expenditure ratio, and IFR and Moderate accessibility variables jointly influence the Disclosure Compliance.

Table 4. Test Results of Simultaneous Significance

 Model	F	Sig.	Conclusion	
 Regression	19.234	.000	Effected	

In table 5, it can be seen that the Independent Ratio variable has a parameter coefficient value of 0.007 with a significance level of 0.534. The significance value is above 0.05 so it can be concluded that the Independence Ratio does not affect the compliance of financial information disclosures. Thus, H1 in this research was not accepted. This result is not in accordance with the results of Wau's research which shows that the regional financial independence ratio has a positive effect on the access of financial information on government websites (Wau & Ratmono, 2015). Similarly, the results of the research by Puspita and Martani which show that regional dependence (DAU) has a positive effect on disclosure of content and disclosure presentations (Puspita & Martani, 2012). From the results of this study it can be seen that local governments have not been optimal in presenting local financial information to the public. Transparency in the form of disclosing financial information via the internet has not become the main thing in providing performance information to the public. Local governments should respond quickly to information needs without having to rely on funds

from the central government, because the closer performance information is to the public, the greater public support for local governments will be.

Model	t	Sig	Conclusion
Independence ratio	.625	.534	Not accepted
Effectiveness ratio	-2.625	.011	Accepted
Efficiency ratio	4.043	.000	Accepted
Routine expenditure ratio	4.848	.000	Accepted
Development expenditure ratio	-4.799	.000	Accepted
Accesibility IFR	.239	.812	Not accepted
Moderate_Independence ratio	770	.444	Not accepted
Moderate_Effectiveness ratio	2.584	.012	Accepted
Moderate _ Efficiency ratio	-4.146	.000	Accepted
Moderate_Routine expenditure ratio	-5.365	.000	Accepted
Moderate_Development expenditure	5.318	.000	Accepted
ratio			

Table 5. Result of Hypothesis Test

From the results of this research, it can be seen that high performance regional governments do not automatically disclose financial information through the internet. The parameter coefficient value of the Effectiveness Ratio variable is -0.220 with a significance of 0.011. The significance value of 0.011 is smaller than at 0.05 so that it can be concluded that the Effectiveness Ratio affects the compliance of financial information disclosures. The results of this study indicate that the local government has optimized or exploited the potential revenue in the region. With the existing creativity and innovation, the regions will be able to achieve the budgeted revenue targets. This achievement requires monitoring and evaluation so that local governments transparently disclose their financial information to the public.

In the third hypothesis, the Efficiency Ratio variable is estimated to affect the compliance of financial information disclosures. After being statistically tested, the hypothesis was proven empirically based on the test results in table 4. The coefficient value of variable parameter of Efficiency Ratio was 0.186 with a significance level of 0.000. The results of this study indicate that the local government has been able to minimize costs incurred to earn revenue and optimize the realization of revenue received in order to improve regional financial efficiency. Local governments have realized that this financial performance information is a positive signal that the public needs to know as accountability for regional budget management and transparency in the use of fees.

In the fourth hypothesis, it is stated that the ratio of routine expenditure affects the compliance of financial information disclosures. Empirically, the hypothesis can be accepted according to the results of statistical tests in table 4. The value of variable parameter coefficient of Routine Expenditure Ratio is 0.002 with a significance level of 0.000. In the regional budget, routine expenditure posts have a fairly large cost allocation because they are used to finance expenses such as employee salaries, purchasing equipment, etc. The high allocation for routine expenditure items requires supervision and evaluation from the public, so the demands for financial transparency must be met

by local governments. Financial information in the budget realization report is published and can be accessed by the public.

Seeing the results of the hypothesis test in table 4, there is a coefficient value of variable parameter of Development Expenditure of -0.010 and the significance level at the level of 0.000. This shows that the significance value is far below 0.05 so that H5 in this research is acceptable. So it can be concluded that the ratio of development expenditure affects the compliance of financial information disclosures. The development expenditure ratio is still at a level below the routine expenditure ratio, which means that development spending is not yet a top priority in the regional budget. This development expenditure affects and infrastructure. Transparency and evaluation are urgently needed by the public to control the use of this development budget, so that financial information in the budget realization report is needed by the public. Therefore, the local government strives to meet the demands of the community as a form of accountability to the public.

The results of this research also indicate that financial performance in the form of Effectiveness Ratios, Efficiency Ratios, Routine Expenditure Ratios and Development Expenditure Ratios have been shown to influence the compliance of financial information disclosures. The results of this research do not support the research results of Chusna which states that the financial condition, level of dependence and prosperity of the region does not have a significant effect on the level of disclosure of information on regional financial management on the website (Chusna, 2016). The results of this research also refute the research results of Istikomah & Mutmainah which states that the dependency ratio has a negative effect on the publication of regional government financial statements through the internet (Istikomah & Mutmainah, 2017). Likewise, the research results conducted by Puspita and Martani which stated that regional performance described as the ratio of regional PAD and Expenditures did not affect the disclosure of content, presentation of disclosures, and total disclosure for regional government websites (Puspita & Martani, 2012).

Based on the test results in table 4, it is known that the coefficient value of variable parameter of IFR accessibility is 0.749 with a significance level above 0.05. These results indicate that empirically IFR accessibility does not affect the compliance of financial information disclosures. Accessibility IFR is the easy steps to obtain financial information from the official local government website. Even though there is an Instruction of the Minister of Home Affairs No. 188.52 / 1797 / SJ / 2012 which must be obeyed by local governments but the components on the local government website are still incomplete. As stated by Verawaty (2016), local governments have not been too serious in managing e-government, including in presenting financial reports as a form of public accountability.

The inconsistency of some of the research results above, it turns out, can be overcome by making IFR accessibility variables as moderating. With the existence of financial ratios that show high financial performance and are supported by the ease of accessing financial information, the compliance of financial information disclosure on the official website of the government will be higher. So the results of this research support the research results of Styles & Tennyson's which states that cities with high per capita income and high levels of financial information disclosure will provide financial reports on the internet (Styles & Tennyson, 2007).

With good financial performance, high per capita income will encourage regional governments to provide financial information on the internet in full.

In the seventh hypothesis in this research, it was stated that the IFR Accessibility variable as moderating between the independence ratio to the compliance of financial information disclosure. After being statistically tested, the results of coefficient value of moderate variable parameter were at -0.002 with a significance level of 0.444. This indicates that the IFR Accessibility variable is not moderated between the Independence Ratio and Compliance with financial information disclosures. The results showed that the ease of obtaining financial information (IFR accessibility) did not provide a stimulus for local governments to increase transparency in internet-based financial reporting. Dependence on the central government is an obstacle in realizing financial information disclosure in Indonesia.

Unlike the eighth hypothesis which reveals that IFR accessibility can moderate the effect of the effectiveness ratio on compliance with financial information disclosure, this hypothesis is accepted and can be proven statistically. The parameter coefficient value of effectiveness ratio variable is 0.066 with a significance level of 0.012. This significance value is smaller than 0.05 so it can be concluded that IFR Accessibility is a moderation between the effectiveness ratio of compliance with financial information disclosure. Local governments that have tapped into all regional potentials to optimize revenue will make it easier to disclose financial information to the public through IFR accessibility. The public can easily get information on the effectiveness of regional finances which is a positive signal from the local government.

In the ninth hypothesis, IFR accessibility will be tested as moderating between efficiency ratios and compliance with financial information disclosures. Table 4 shows that the hypothesis can be accepted based on the results of the test obtained which is with a significance level of 0,000, while the parameter coefficient value is -0.062. So it can be concluded that IFR accessibility can moderate the effect of efficiency ratios on compliance with financial information disclosure. With easy access to financial information, the public can supervise the use of regional budgets while still paying attention to budget efficiency. Thus, local governments will be more transparent in managing regional spending.

In table 5, the data shows that the parameter coefficient value of the moderate variable is -0.001 and the significance level is 0.000. This shows that IFR Accessibility is a moderating variable between the ratios of routine expenditure to compliance with financial information disclosure so that the research hypothesis can be accepted. The local government as the mandate holder of the community will be more transparent in the management of routine regional spending. When the budget realization report can be easily accessed by the public, the use of routine regional expenditure posts can be controlled so that local governments remain optimal in providing services to the public.

The eleventh hypothesis states that IFR accessibility can moderate the influence of the development expenditure ratio on compliance with financial information disclosures. The results of statistical tests show that the moderate coefficient value is 0.004 and the significance level is 0.000. With a significance value that is smaller than 0.05, it can be concluded that IFR accessibility is moderating between the development expenditure ratios to compliance with financial information disclosure. The ratio of development spending has a smaller portion than routine expenditure. Although small, development spending is made to provide services to the community in the form of facilities and infrastructure. Implementation of budgeted local government projects can be monitored through financial information on the official local government website. The transparency of the use of the budget will increase when local governments make this financial information a positive signal to get support from the public.

Thus from the 11th hypotheses proposed in this research, there are 3 hypotheses that are not statistically proven. The unacceptable hypotheses are H1, H6 and H7, while the other 8 hypotheses can be accepted empirically. The Independence ratio variable and IFR Accessibility variables do not directly influence the compliance of financial information disclosures. In addition, IFR Accessibility does not moderate the influence of the Independence Ratio on compliance with financial information disclosure.

In table 6, it can be seen that the magnitude of the adjusted R Square is 0.751 which means that 75,1% of disclosure compliance variation can be explained by independent variable of financial performance (including independence ratio, effectiveness ratio, efficiency ratio, routine expenditure ratio, and development expenditure ratio), independent variable of IFR accessibility and Moderate. The rest of 24,9% is explained by other factors outside the model.

Table 6. Determination Coefficient

Model	Adjusted R square	Conclusion
1	.751	75,1%

7. Conclusions

Based on the results of the discussion, it can be concluded that Financial Performance and IFR Accessibility influence the Compliance of Financial Information Disclosure. It is partially proven that the ratio of effectiveness, efficiency ratio, ratio of routine expenditure and ratio of development spending affect compliance with financial information disclosure on the official government website. This proves that local governments have shown transparency in financial management. The financial information presented on the official government website is a form of accountability for the mandate that is held as a provincial-level executive agency. The community can control whether during the current period the regional government has optimally explored the regional potential to fulfill all regional expenditure effectively and efficiently. The use of budgets in routine expenditure items and development expenditures can be monitored by the public through a budget realization report published on the official local government website. So it is expected that there will be an increase in service quality and an increase in community welfare.

The existence of the internet that is easily accessed by the public to obtain financial information has a very large role in realizing transparency in public finances. Financial information that shows the financial performance of local governments is a positive signal for the community that will indirectly affect public support for the government itself. In order to achieve reliable internet accessibility, inexpensive facilities and infrastructure are required. Therefore, support from the central government is needed and the seriousness of local governments, to produce reliable financial information. This is why the independence ratio statistically has no effect on compliance with financial information disclosure.

This research has implications for the implementation of e-government policies for regional governments. Regional governments must begin to pay attention to the proportion of development expenditure compared to spending on consumptive interests. A successful e-government requires significant investment of funds for infrastructure and reliable human resources, so support from the central government is required. The successful implementation of e-government will provide great benefits, especially in terms of time and cost efficiency in disseminating information to the public. Similar research is needed to determine other factors that influence compliance with financial information disclosure in supporting financial transparency.

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