Using Artificial Intelligence in Digital Citizen Participation: Applications, Perceptions, and Design Principles

Antoine Clarinval[1], Nicolas Bono Rossello[1], Annick Castiaux[1] and Anthony Simonofski[1]

[1]*Namur Digital Institute, University of Namur, Belgium*

Abstract

Artificial Intelligence (AI) is expected to deliver many benefits for digital citizen participation, e.g., by allowing citizens to comprehend larger amounts of data or providing balance to the difference in resources between citizens and governments. However, using AI in citizen participation is not a straightforward task. Its inherent complexity, opaque nature, and power to influence public discourse plague AI developments with a substantial number of risks. Making matters worse, the currently nascent literature in this area provides a limited understanding of the implications of AI for citizen participation. Our BeCoDigital research project aims to shed some light on the use of AI in citizen participation by providing a roadmap on how to use AI within this context. Our roadmap provides insights and recommendations around three aspects. **WHAT** are the current applications of AI in citizen participation, **WHY** should AI be used in this context according to citizens and practitioners, and **HOW** (i.e., which principles to follow) to implement AI solutions in citizen participation.

Keywords

Artificial Intelligence, Citizen Participation, Design Science Research

1. Introduction

This poster presents three perspectives of AI use in citizen participation that we explored and the findings we obtained at this stage. First, a typology of possible AI uses in citizen participation (WHAT), then a Q-methodology study of citizens and government practitioners' perceptions of AI use (WHY), and finally a set of design principles for the implementation of AI solutions (HOW). This work is the first milestone of a project [1] studying AI and citizen participation that we intend to push further.

2. Applications of AI in Citizen Participation

The diversity of AI-driven techniques provides a rich variety of solutions that could be transferred and exploited in citizen participation. However, the scattered literature between fields makes it hard to evaluate the current state-of-the-art, the level of compatibility between these approaches, and their relevance for citizen participation. In fact, AI is a broad term associated to several technologies that do not necessarily share the same characteristics and social impacts. Thus, before implementing AI systems in citizen participation, there is a clear need to develop a theoretical foundation that shows how to operationalize these emerging technologies in citizen participation. We achieve this by analyzing the literature at a more abstract level. We define a typology common to all the AI-enhanced solutions related to digital participation platforms. The typology is built along two dimensions. First, the role of AI, that can either take over tasks for humans (automation) or work collaboratively with them (augmentation). Second, the scope of the AI, that can work at the level of a single citizen (individual), of the interaction between citizens (peer-to-peer), or of the citizen participation initiative globally (collective). Thus, our typology describes 6 types of AI solutions for citizen participation summarized in Table 1. Beyond its descriptive contribution, the typology can also be used to evaluate future avenues and challenges in the use of AI in citizen participation.

Proceedings EGOV,CeDEM-ePart conference, September 1-5, 2024, Leuven, Belgium

antoine.clarinval@unamur.be (A. Clarinval); nicolas.bonorossello@unamur.be (N. Bono Rossello); annick.castiaux@unamur.be (A. Castiaux); anthony.simonofski@unamur.be (A. Simonofski)

0000-0003-3936-0532 (A. Clarinval); 0000-0003-4624-2753 (N. Bono Rossello); 0000-0001-5290-5993 (A. Castiaux); 0000-0002-1816-5685 (A. Simonofski)

Table 1
Typology of AI applications in digital participation platforms [2].

	Individual level	**Peer-to-peer level**	**Collective level**
Automat.	Processing tools Processing information that facilitates the individual tasks of the participants during the participatory process.	Recommendation tools Generating potential links in terms of proposals or users.	Analysis tools Generating quantitative indicators related to the outcome of the participatory process.
Augment.	Individualized feedback AI interaction to improve the performance, motivation or knowledge of individuals.	Enriching feedback AI interaction to trigger knowledge relations and enrich the individual and collective inputs.	Collective feedback AI interaction based on processed collective data to optimize the overall participatory process.

3. Perceptions of AI Use in Citizen Participation

According to Technological Frames theory, misalignment between the expectations of stakeholders involved in a technological development can lead to a negative impact on acceptance and counterproductive effects. This issue is all the more pressing in the case of AI use in citizen participation, since previous works have reported diverging views on citizen participation and AI across citizens and government practitioners. For AI to be used in citizen participation in a way that is aligned with expectations and realizes its potential, it is essential to investigate how citizens and practitioners perceive AI use in this context, and to identify and solve any misalignment. We achieve this by collecting the discourse related to AI use in citizen participation and applying the Q-methodology to collect, analyze, and compare the subjective viewpoints of citizens and practitioners.

4. Design Principles for AI Use in Citizen Participation

Current AI solutions focus mainly on technical challenges, neglecting their social impact and not fully exploiting the potential of AI to empower citizens. We investigate how to design digital participation platforms that integrate technical AI solutions while considering the social context in which they are implemented. Using Collective Intelligence as kernel theory we generate design principles for the development of a socio-technically aware AI architecture. We validated them with AI and citizen participation experts. The principles suggest (1) optimizing the alignment of AI solutions with the citizen participation project goals, (2) ensuring their structured integration across multiple levels, (3) enhancing transparency, (4) monitoring AI-driven impacts, (5) dynamically allocating AI actions, (6) empowering users, and (7) balancing cognitive disparities. These principles constitute a theoretical basis for future AI-driven artifacts and theories in digital citizen participation.

Acknowledgments

The research pertaining to these results received financial aid from the Belgian Science Policy Office according to the agreement of subsidy no. [B2/223/P3/BeCoDigital].

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