Flattening the Curve with Civic Technologies: A Case of Open Innovation during COVID-19

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Abstract
This paper draws from previous research on crowd-civic systems to present the case of Mobadarat, an open innovation platform to crowdsource ideas and solutions to contribute to the COVID-19 response. Mobadarat leverages local capacities and digital infrastructure to channel ideation and solutions sourced from the local community. The paper also considers the issue of

building trust between different stakeholders in this process and suggest further lines of research on civic technologies.

Author Keywords
Open innovation; crowdsourcing; crowd-civic systems; collective intelligence.

CSS Concepts
• **Human-centered computing~Collaborative and social computing**; *Empirical studies in collaborative and social computing*

Introduction
COVID-19, the first pandemic of the digital age, has crudely revealed the limits of our emergency systems. In many countries, the response to the event has been hampered by unpreparedness and lack of both coordination and resources. Yet, the pandemic has also accelerated digitally enabled forms of collective intelligence that have been tested and deployed over the last decade: crowdsourced crisis mapping, citizen science, and peer-to-peer networks of open innovation. This paper briefly examines the role of civic technologies in the pandemic emergency by presenting the case of Mobadarat, an open innovation platform developed in Morocco to address COVID-19 related issues. The structure of the paper follows the questions that this workshop on civic technologies addresses: (i) role of local contexts and infrastructures (and case study); (ii) key elements in building trust, and (iii) methods and strategies for conducting research on civic technologies. We conclude by suggesting further lines of research in this area involving open data.

The Role of Local Context and Infrastructure in Designing, Implementing, Adopting, and Maintaining Civic Technology
For some years now, crowdsourcing and open data have evolved as a powerful method for civic engagement in crisis and emergency situations [5,6]. In this context, crowd-civic systems—broadly defined as systems blending digital technology, design, and public data [2]—leverage crowdsourcing tools and techniques to enhance the discovery of relevant local information about issues of public concern. Previous research on crowd-civic systems [7] has proposed to consider them as part of broader "linked democracy" ecosystems with some specific properties: (i) contextually-bound (defined by an inner environment); (ii) open-ended (adaptive); (iii) blended (offline and online interactions); (iv) distributed (networked structures); (v) technologically agnostic (based on needs); (vi) modular (composable modules); (vii) scalable; (viii) knowledge-reusing (taping on multiple sources); (ix) knowledge-archiving (keeping knowledge accessible); (x) aligned (consequential). By leveraging digital technologies, therefore, crowd-civic systems can produce collective, reusable commons-based knowledge with consequential effects. In other words, when decisions are made or solutions are reached, the outcomes can be consequential and extend their reach to the outer context, aligning with and informing external processes of decision making.

Case study
Mobadarat.ma was born in March 2020, one week after the declaration of lockdown in Morocco. Launched by Impact For Development (IFD) in partnership with the School of Collective Intelligence of University in partnership with the School of Collective Intelligence at

University Mohamed VI polytechnic and Alakhawayn University, the platform aimed to create a space where the community's collective intelligence can be utilized to address the effects of COVID-19 in Morocco.

Mobadarat.ma[1] leverages crowdsourcing as a method combined with both bottom up and top down strategies:

- Ideation: The use of crowdsourcing to enable participants to share their ideas and proposals regarding the emerging Covid-19 related challenges.
- Initiatives Observatory: a bottom-up approach that enables cross learning and knowledge exchange. It also provides open government stakeholders with a platform to collectively and proactively tackle the challenges at hand. In turn, the tool collects and publishes lessons learned.
- Open challenges: a top-down approach consisting of a space where decision-makers can share their challenges and ask the community to submit proposals and solutions.

Mobadarat has been adopted by the United Arab Emirates University in the UAE context. This expansion opens the door for international collaboration and learning in open innovation. In this regard, and as part of its effort to breaking international knowledge silos, IFD, in partnership with GovRight, has also launched OpenDev Library, a benchmarking platform combining initiatives, policies and approaches in various policy areas, co-created and undertaken by stakeholders as part of their efforts to foster further development.

Key elements of the configuration of trust among government, citizenry, and local organizations

The erosion of citizens' trust in democratic institutions is one of the most noted trends in recent years, together with the rise of populist solutions [1]. Mobadarat.ma aims at introducing a new relational paradigm based on an epistemic relationship between citizens and governments. This relationship builds on the capability of "a group of individuals to envision a future and reach it in a complex context" and the idea that "knowledge is openly shared, used and remixed" [7]. This paradigm requires further engagement from citizens to become a driving force in creating proposals and solution-driven approaches to challenges.

The strategy to leverage the capacities of citizens to collectively produce innovative solutions has long manifested itself in fragile states, such as the recent emergency in Lebanon shows. Yet, these citizen-driven solutions are often dismissed as mere reactions to the inability of those states to fulfill their needs and thus they can only exist in fragile contexts. In our view, citizen-driven initiatives may offer a wide array of lessons learned beyond its immediate local context. The goal of mobadarat.ma is reusing that knowledge and adapting it to the context of other developing countries.

Methods and Strategies for Conducting Research on Civic Technologies

Research on civic technologies is multidisciplinary and applies different methods and strategies, depending on the theoretical and empirical focus. In recent work [8], for example, we analyse mutual help as a digital commons and consider whether digitally-enabled mutual help aligns with Ostrom's design principles for the sustainable management of common-pool resources [3].

Artificial Intelligence has also been adopted in civic technology research and applications. In our view, this requires a *middle-out* approach rather than top-down or bottom-up ones. As stated in [4], forms of engagement require coordination mechanisms that are in-between, middle-out, as neither co-regulatory models nor self-regulation are adequate to comply with the ethical, legal and technological requirements needed in the interplay of civics and technology. Linked democracy designs should endorse the set of principles for Open Governance—e.g. traceability, transparency and accountability—and the recommendations for a responsible AI design—security, scalability, adaptability, modularity, interoperability. This is the common framework in which the tools and metrics of digital data analytics—Natural Language Processing, Machine Learning and Representation Languages—can be implemented and embedded to facilitate the emergence of sustainable civic technology ecosystems.

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