Doctoral Dissertation
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Blockchain for civic initiatives in the urban space

Cristina VIANO

Supervisor(s):
Prof. Chiara Certomà, Supervisor
Prof. Guido Boella, Prof. Marco Santangelo Co-Supervisor

Summary

Processes of civic participation and social economies in local and urban communities are increasingly affected by digitalization, and in turn contribute to redefining technological paradigms towards more participatory digital tools. Blockchain technologies have only recently appeared in this domain. The reason why blockchain is of interest is that it allows community members to digitally represent (tokenize) and transfer assets of value without intermediaries. There is much debate concerning blockchain technology due to its potential for disintermediating established governance models, and lack of evidence concerning its socio-political implications especially in social and civic domains. The technology is mostly associated with global speculative cryptocurrencies, or with complex systems for automated tracking of transactions.

This research focuses instead on how blockchains can be developed and used for civic, social and collaborative economies in local communities, which represents an innovative understanding of the technology affordances. The study focuses on the case of CommonsHood, a blockchain-based wallet app developed by the Department of Computer Science at the University of Turin for an experimental research project of which the author of this research is an active member. The application aims to make blockchain functionalities accessible and adaptable to the socio-economic needs of different communities, by allowing non-expert users to create cryptographic tokens and model the desired exchange systems.

The overall goal of the research is to contribute to better understanding, design and development of blockchain-based tools for digital social innovation. The geographical perspective contributes to understanding the socio-spatial implications of using blockchain as a civic technology, and to embedding the technical developments in local socio-economic contexts. The research builds on interdisciplinary literature from digital, urban and economic geography; from computer science, human-computer interaction (HCI) and design, and from policy analysis. Technical and functional explanations of the technology are considered together with a critical investigation into its implications. The concepts of digital social innovation, digitally-enabled co-production, alternative urban digitalization, and urban digital platforms are mobilised together with the "reading for difference" approach to frame a multidimensional analysis of the app pilots, using qualitative methods.

The study starts by defining the civic blockchain approach advanced by the CommonsHood project. It analyses how this approach interprets blockchain properties in a way that is oriented towards civic purposes, and how it addresses some of the risks associated with tokenized economies and governance, risks such as commodification and algorithmic control.

The empirical investigation focuses first on how the digital tool is shaped by local contexts (how it is designed and developed to be context-based). The communities of users co-design both the socio-economic models and their associated tokens and smart contracts. Such profound adaptability to different socio-economic contexts requires a challenging process of context-based co-design. It also implies distinction as to which interactions can be tokenized, and which ones should not due to risks of excessive commodification.

Second, the experimentation looks at how this digital tool can shape local contexts (its effects on their socio-economic spaces and spatialities). Two models of tokenized social economies are considered: rewards for civic participation, and a community sharing economy. They are expected to foster socio-economic interactions characterised by geographical proximity. Transactional, relational and transformational approaches to social interactions coexist. This is reflected in the way urban places are defined. Communities with an intermediate extension and level of cohesion among members are those in which the application appears more relevant, since tokenized transactions can strengthen weak forms of trust.

This research shows a viable methodology for redeploying blockchain as a civic technology and for implementing context-based design and use of blockchain-based wallet applications. Interdisciplinary action research plays an important role in matching social needs to technical developments.