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Digital platforms and online applications for user engagement and collaborative innovation

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Abstract

Modern cities face today a wide range of problems (crime, pollution, traffic congestion, unemployment) which affect the whole spectrum of economic and social life in the urban space. Although the design and implementation of urban strategies targeting such complex problems constitutes a task of governmental and municipal authorities, more recent views place the matter very close to the collaborative efforts of individuals through the sharing of responsibility and participation to active planning. In recent years, response and participation of citizens has been elevated through the use of social media and the development of web-based tools and collaborative platforms, the power of which has proven to be significant in many cases.

This article, based on the experience of two research projects, studies a number of web based applications and digital platforms that serve as facilitators for the participation of citizens in activities of collaborative innovation. More specifically, by examining the dynamics of such tools on different stages of the innovation process, from idea generation to experimentation and financing, we discover new forms of interaction and engagement among different actors of the innovation ecosystem. Such forms of collaboration allow the emergence of collective intelligent which can enhance or even replace the efforts of responsible authorities, as they lead to more innovative and effective solutions, more informed decisions, while it can also ensure wider acceptance by the community and the relevant stakeholders.

Keywords: Digital platforms, Collaborative innovation, Open innovation, Smart specialization, Innovation ecosystems.

1. Introduction

Today both companies and cities face intense competition urging them to become better, smarter and more sustainable. Yet, the problems they have to meet are of unprecedented complexity. On the one hand, the financial crisis and the subsequent uncertainty in the credit markets, rigid policy regulations, information overload, keeping up with the technological advancements, innovation creation and management, are only few of the challenges that firms have to meet. On the other hand, the global competition of cities for investments and new firm attraction, in addition to urban problems such as crime and aggression, pollution, traffic, unemployment urge public authorities to increasingly dedicate greater resources in terms of funds and capabilities. Such problems not only affect citizens but the whole spectrum of economic and social life in the urban space and determine the character of entire local communities (Raco, 2007). Given that individual efforts - at the firm or municipal level - are of high cost and can only address a fraction of the abovementioned challenges, notions such as “open innovation” and “collaborative innovation” have become particularly popular in the scientific

discourse. These notions have been assisted by the developments and contemporary pervasiveness of digital technologies (De Falco *et al*, 2017) and altogether create a multidisciplinary field of research that spans from urban and regional development to economic geography, business management studies, information technology and political science (Schaffers *et al*, 2011).

The paper reviews a number of digital platforms and web based tools as a means for integrating citizens into collaborative innovation activities ranging from policy design and implementation to self-organisation and generation of solutions to everyday problems. These tools empower the innovation ecosystem by serving different stages or functions of the innovation process improving, thus, the “smartness” of an area. Our analysis starts with the description of one application of collaborative vision sharing, selected from a set of web-based applications that support bottom-up policy design and implementation. The case study’s platform has been developed by an H2020 project, Online S3 (ISSI-4-2015) and focuses on the design and implementation of Smart Specialisation Strategies (RIS3), i.e. place based regional innovation strategies aiming to smart growth. We continue by reviewing two applications that enable open innovation and collaborative problem solving in an urban environment focusing on the mechanisms that increase user engagement and activate their collective intelligence. This cloud-based platform has been developed within the framework of a past Competitiveness and Innovation Project (CIP), named STORM-Clouds.

2. Digital platforms and the open innovation paradigm

The open collaborative approach of innovation constitutes a fundamental change in problem solving capability as it enhances wider participation in the innovation process, it enables network effects to take place while it also reduces transaction costs. The concept of “open innovation” has been developed by Henry Chesbrough to describe “the purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation” (Chesbrough, 2003, 1). Open innovation is a wider term which can occur in different modes, with collaborative innovation being one of them (De Falco *et al*, 2017).

The rise of the open collaborative innovation paradigm has democratised the way innovations are being produced by allowing the participation of a diverse set of actors (external experts, scientists, suppliers, users, citizens, stakeholders) in the innovation process enabling thus the use of knowledge heterogeneity generated by an unlimited pool of external innovators (Heil and Bornemann, 2017). This open approach in the innovation making is not only restricted in the business environment but can be also applied to policy making, or citizen engagement towards complex urban and community problems (Tukiainen *et al*, 2015; Cohen *et al*, 2016). In the recent literature, the establishment and study of collaborative innovation environments within the urban context has been captured through the notion of living labs (LLs).

Living Labs are spaces that bring users at the center of the process of innovation. Built upon the open innovation concept, they draw on the notion of external ideas as a resource (Bergvall-Kåreborn *et al*, 2009) and bring experimentation to real-life environments. Unlike the previously closed schemes of companies and research centers, LLs aim at integrating both user-centered research and open innovation, encouraging the participation of diverse types of users and partners. Their novelty compared to other innovation approaches is widely accepted as two-fold (Schuurman *et al*, 2012): on the one side, they support new forms of user involvement, through interactive and empowering ways of participation and co-creation (Eriksson *et al*, 2005); on the other side, they evolve in real life contexts which means they can overcome hurdles in contextual difficulties related to sticky information and tacit knowledge (Almirall *et al*, 2012).

In the recent literature there are several perspectives on how users are or should be involved in the LLs context (Beutel *et al*, 2017; Eriksson *et al*, 2005; Schuurman *et al*, 2012). More specifically, users may be involved since the initial stage of research for a product that may include a context analysis and the definition of goals and objectives. In other cases, users could contribute to innovation

through product development and testing, for example through online interaction in the development of smart city applications. Finally, the participation of users could be also oriented to the later stages of implementation, commercialization or even evaluation of a product. Sometimes, user-related activities are conceived as user-involvement processes, but they do not actually involve co-creation.

Today the realisation of collaborative innovation can be transformed and empowered by the use of web technologies. Digital platforms and web based tools for open collaborative innovation provide a virtual environment for knowledge transfer and integration and can be leveraged by start-up businesses to dominate or disrupt traditional industries or to launch new ones (De Falco *et al*, 2017). They can also be used by the government for the design and implementation of bottom-up innovative solutions to complex problems and create new sources of value where regulatory control is holding them back (Parker *et al*, 2017). The platform “provides an open, participative infrastructure of interactions and sets governance conditions for them” with an overarching purpose to “consummate matches among users and facilitate the exchange of goods, services or social currency thereby enabling value creation for all participants” (Parker *et al*, 2017). In addition to this, the internet allows wider aggregation and integration of different members in an innovation community (Battistella and Nonino, 2012).

During the last decade we see the rise of a wide number of web based platforms supporting the different stages of innovation process, from idea generation, to financing and marketing. The level and type of user participation in these platforms varies extensively and can range from a simple voting to content generation (new idea/solution, data, software) or financial contribution. Below we review some of the most popular of these:

- *Idea generation and screening.* The most popular web-based platforms for collaborative innovation refer to crowdsourcing ideas. Platforms that focus on brainstorming and providing feedback on a new idea may focus on business ventures like IdeaConnection, Threadless, Innocentive, and Kluster or social innovation, in the sense of designing solutions for the world’s biggest challenges like Global Ideas Bank and OpenIDEO.
- *Experimentation and implementation.* This may refer to commons based peer production (such as Wikipedia), which according to Battistella and Nonino (2012), is a bottom-up model of socio-economic production where a wide number of individuals is coordinated into large projects without traditional hierarchical organisation. It may also refer to fab lab platforms, such as Fab Lab Connect or Fab Lab Platform, which break down the boundaries between the digital and physical world by providing tools to manage Fab Labs (e.g. book workshops, reserve machines and space etc.). Finally, it might refer to platforms that allow the sharing of individuals’ resources through the use of new business models that disrupt traditional industries (e.g. uber, Airbnb).
- *Financing.* Crowdfunding practices, aiming to raise monetary contributions from a large number of people, are more effectively (more securely and with higher scalability) performed through digital platforms. Among others Kickstarter, Indiegogo are popular platforms that aim to secure funds for a new business venture, while Citizinvestor, Neighbor.ly or Spacehive are mostly used for crowdfunding neighbourhood-driven urban projects (Cathcart-Keays, 2016).

Apart from the firm innovation perspective, we see over the last decade digital platforms of open innovation being increasingly used for policy making and collaborative governance. Besides, although urban strategy planning and implementation is a task that belongs to the central government, more recent views place it very close to the collaborative effort of individuals through the sharing of responsibility and participation to active planning. In fact, citizens’ response and participation has emerged through the use of social media, and the development of online tools and collaborative platforms, the power of which has been proven to be massive in many cases (Vieweg *et al*, 2010; Yates and Paquette, 2011). Citizens are being increasingly engaged in contributing to the efforts of the public authorities by sharing information through different means and by actively taking part in the design of solutions to these challenges (Sestini, 2012). The resulting collective intelligence, can properly

complement and increase the capacities and effectiveness of civil protection strategies and policies, leading to better informed decision-making processes and empowered governmental entities and citizens (Komninos, 2014).

3. Collaborative innovation in Central Macedonia through web based tools

This section reviews three web-based tools that consider user engagement as their main vehicle for the production of innovation. At the same time, the selected applications support user engagement in a different stage of the innovation process. All three applications have been developed and offered on top of digital platforms developed within the framework of EU funded research projects, Online S3 and STORM Clouds and have been tested through pilot implementations in the region of Central Macedonia. The first platform gives access to free online tools and a comprehensive guide for creating, monitoring and updating regional or national Smart Specialisation strategies (Panori *et al*, 2018; Griniece *et al*, 2017; Panori *et al*, 2017). The second one, offers open source solutions that facilitate the deployment of civic applications enabling different actors of the innovation ecosystem to engage and interact. Their common characteristic refers to the use of the platform as a framework for the establishment of a collaborative environment facilitating innovation. For each application, we explore the ways in which users are engaged as well as the type of innovation and the relevant stage of the innovation process to which the application contributes.

Application 1: Collaborative Vision Building

This application supports the creation of a collective vision for the future of a region through a structured collaborative process. Among the large number of tools offered within the Online S3 platform (Panori *et al*, 2018; Tsarchopoulos *et al*, 2018), the current application facilitates the phase of strategy formulation in the RIS3 process aiming to the elaboration of an overall vision for the future of the target region. By allowing stakeholders from different backgrounds and perspectives to work together and exchange ideas, the collaborative nature of the vision building process is significantly enhanced. Additionally, through documenting each step of the process, all stakeholders can easily track the evolution of the process and see the full progress once the process is complete.

In this context, *Collaborative Vision Building* supports user engagement at the first stage of the innovation process as presented in the previous section, which is idea generation and screening. Users are encouraged to share their ideas about the future of a region, as well as provide feedback and discuss existing proposals. By gathering input from all users, a common, shared vision for the regions' future is built as a result of collaborative process.

Application 2: Thessaloniki Virtual Mall

One of the applications provided by the STORM-Clouds platform is *Thessaloniki Virtual Mall*; an application that enables commercial enterprises to be present online and collaborate for the development of new services. On the one hand, the service offers the possibility to every commercial enterprise located in the city center to create its own virtual shop, enabling customers to access a variety of existing shops through a shared platform. On the other hand, it supports the creation of open, virtual malls consisting of groups of shops with geographical proximity that offer combined deals, or other collaboration schemes agreed by the shop owners. Therefore, in terms of commitment, the participating shops may be either completely independent (by offering information and link to their own site) or fully integrated in to the mall (offers and purchases are available only through the platform).

Thessaloniki Virtual Mall supports user engagement at the second stage of the innovation process, which is experimentation and implementation. The group of users in this case includes both shop owners and customers, but shop owners are the ones who mainly lead the collaborative process. They are encouraged to cooperate and coordinate among them, experimenting with new services and different types of collaboration schemes, such as combined offers or discounts. At the same time, customers are able to participate through commenting and rating existing products and services.

Consequently, the application has a great potential on strengthening collaboration among shop owners and customers through developing and testing new services.

Application 3: Crowdfunding Platform for Social Good

Another application of the STORM-Clouds platform is the *Crowdfunding Platform for Social Good*, an application that supports civic crowdfunding activities. Aiming at encouraging Thessaloniki's local communities to collect money for social and charitable purposes, the platform offers the ability to co-finance three types of projects:

1. Projects aiming to improve urban open spaces (i.e. creation of parks and playgrounds, restoration of monuments, expansion of bike lanes, etc.). These projects could combine private and public funding.
2. Projects for social entrepreneurship (i.e. creation of non-profit enterprises to promote objectives that improve the city life or strengthen its social capital. The Municipality acts as a mediator of the initial effort.
3. Projects for knowledge-intensive and technology-based youth entrepreneurship. This application clearly supports user engagement at the third stage of the innovation process which is financing. Users are involved in the development of projects of the above categories through their financial contribution. The main difference of this platform compared to other popular crowdfunding platforms is the focus on funding projects with social impact and collective returns.

4. Conclusions

Nowadays, the development of digital platforms and online applications is expanding radically, affecting significantly human activities at all levels, from policy making and governance, to socio-economic models of production. We argue that these technological achievements allow wide participation in the innovation process, strengthening and seizing network effects, and enhancing the ability of people to collaborate and create bottom-up innovative solutions to complex problems.

The applications presented in this paper reflect how user engagement can be achieved in different stages of the innovation process as well as how user engagement can lead to collaborative innovation. Ranging from idea generation to experimentation and financing, all applications allow the establishment of different schemes of collaboration among actors of a local ecosystem. Therefore, they reveal complementary aspects of local and open innovation, emerged through the aggregation of resources or even through the modernization of business practices by digital means. Finally, as all applications have been tested in real world environments, they may be relevant, scalable and transferable also to other areas/urban context and types of innovation ecosystems. Apart from the investigating more online tools and platforms that contribute to other stages of the innovation process (e.g. networking, schemes of collaborative manufacturing), future research could also highlight emerging technical or methodological problems such as the difficulty to create open communities with a critical mass, the unavailability of open data, limitations caused by data privacy, security and ownership, legacy infrastructure and systems integration etc.

5. References

Almirall, E., Lee, M., and Wareham, J., (2012), Mapping Living Labs in the Landscape of Innovation Methodologies, *Technology Innovation Management Review*, 2, 12–18.

Battistella, C., and Nonino, F., (2012), Open innovation web-based platforms: The impact of different forms of motivation on collaboration, *Innovation*, 14(4), 557-575, <http://dx.doi.org/10.5172/impp.2012.14.4.557>.

Bergvall-Kåreborn, B., Ihlström Eriksson, C., Ståhlbröst, A., and Svensson, J., (2009), A milieu for innovation: defining living labs, *In Proceedings of the ISPIM Innovation Symposium*, New York City, USA, 12.

Beutel, T., Jonas, J.M., and Moeslein, K.M., (2017), Co-Creation and User Involvement in a Living Lab: An Evaluation of Applied Methods, *In* Leimeister, J.M., and Brenner, W., (Hrsg.), *Proceedings der 13 Internationalen Tagung Wirtschaftsinformatik (WI 2017)*, St. Gallen, 1453-1464.

Cathcart-Keays, A., (2016), How London uses crowdfunding to build projects – and community, *Citiscope*, <http://citiscope.org/story/2016/how-london-uses-crowdfunding-build-projects-and-community>.

Chesbrough, H., (2003), *Open Innovation*, Boston, MA, Harvard Business School Press.

Cohen, B., Almirall, E., and Chesbrough, H., (2016), *The City as a Lab: Open Innovation Meets the Collaborative Economy*, *California Management Review*.

De Falco, E. S., Renzi, A., Orlando, B., and Cucari, N., (2017), Open collaborative innovation and digital platforms, *Production Planning & Control*, 28(16), 1344-1353. <http://dx.doi.org/10.1080/09537287.2017.1375143>.

Eriksson, M., Niitamo, V.P., and Kulkki, S., (2005), State-of -the-Art in utilizing Living Labs approach to user-centric ICT innovation – A European approach, Centre for Distance-Spanning Technology at Luleå University of Technology, Sweden.

Griniece, E., Panori, A., Kakderi, C., Komninos, A., and Reid, A., (2017), Methodologies for Smart Specialisation Strategies: A view across the EU regions, 10th International Conference for Entrepreneurship, Innovation and Regional Development, 31 Aug–1 Sept 2017, 321.

Heil, S., and Bornemann, T., (2017), Creating Shareholder Value via Collaborative Innovation: The Role of Industry and Resource Alignment in Knowledge Exploration, *R&D Management*, <https://doi.org/10.1111/radm.12258>.

Komninos, N., (2014), *The age of intelligent cities*, London [u.a.], Routledge.

Panori, A., Komninos, N., Kakderi, C., and Fellnhofner, K., (2017), Smart Specialisation Strategies: An Online Platform for Strategy Design and Assessment, *In* International Conference on Reliability and Statistics in Transportation and Communication, Springer, Cham, 3-16.

Panori, A., Angelidou, M., Mora, L., Reid, A., and Sefertzi, E., (2018), Online Platforms for Smart Specialisation Strategies and Smart Growth, 20th Conference of the Greek Society of Regional Scientists.

Parker, G.G., Alstyne, M.W., and Choudary, S.P., (2017), *Platform Revolution: How Networked Markets are Transforming the Economy and how to Make them Work for You*, W.W. Norton & Company, New York and London.

Raco, M., (2007), Securing Sustainable Communities. *European Urban And Regional Studies*, 14(4), 305-320, <http://dx.doi.org/10.1177/0969776407081164>.

Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson, M., and Oliveira, A., (2011), *Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation*, *The Future Internet*, Lecture Notes in Computer Science, 6656, 431-446.

Schuurman, D., De Marez, L., and Ballon, P., (2012), Towards optimal user involvement in innovation processes: A panel-centered Living Lab-approach, *Proceedings of Technology Management for Emerging Technologies*, 2046–2054.

Sestini, F., (2012), Collective Awareness Platforms: Engines for Sustainability and Ethics' *IEEE Technology and Society Magazine*, Winter 2012, 54-62

Tsarchopoulos, P., Tsampoulatidis, I., and Roman, M., (2018), Digital Tools for Participatory Governance, 20th Conference of the Greek Society of Regional Scientists.

Tukiainen, T., Leminen, S., and Westerlund, M., (2015), Cities as Collaborative Innovation Platforms, *Technology Innovation Management Review*, 5(10), 16-23.

Vieweg, S., Hughes, A. L., Starbird, K., and Palen, L., (2010), Microblogging during two natural hazards events: what twitter may contribute to situational awareness, *In* Proceedings of the SIGCHI conference on human factors in computing systems, ACM, 1079-1088.

Yates, D., and Paquette, S., (2011), Emergency knowledge management and social media technologies: A case study of the 2010 Haitian earthquake, *International journal of information management*, 31(1), 6-13.