Article

Mapping Digital Co-Creation for Urban Communities and Public Places

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Abstract: Increasingly digital communication, social media and computing networks put the end-users at the center of innovation processes, thus shifting the emphasis from technologies to people. In the private sector, this shift to user-centricity has been conceptualized under such approaches as Service-Dominant Logic and Open Innovation 2.0. Public sector conceptualizes the change through the New Public Governance and Open Government paradigms and suggest that the public value is no longer created by the governments alone but in collaboration between the public entities, private sector, civil society organizations and citizens. While traditional approaches to public engagement and governmental transformations remain relevant, this article focuses on the growing potential of networked urban communities to solve the social problems. It expands the co-creation research field and suggests a typology discerning co-creation patterns when enhancing the public spaces with a community-wide participation with the use of creative, innovative and cooperative Information and Communication Technologies' applications. The sample for web-based monitoring consists of 10 digital applications linked with design and improvement of public spaces in Vilnius, Lithuania. The proposed typology framework gives an overview of the state-of-art in the interaction between people, places and technology. The research helps to discern how different technological, organizational and other social factors influence and shape the patterns of co-creative initiatives.

Keywords: co-creation; public spaces; communities; social technologies

1. Introduction

The extent to which the place-oriented communities use creative, innovative and cooperative applications of Information and Communication Technologies (ICT) to support their activities is largely undocumented. Although technologies are used to create and maintain communities surrounding the public spaces, empirically-tested frameworks of sustainability, longevity and successful change factors are limited. The article is a part of the C^{3}PLACES project which focuses on developing the strategies and tools to increase the quality of public open spaces through the use of digital tools by positively influencing co-creation and social cohesion effects. The C^{3}PLACES generates knowledge and know-how to use the co-creation approach in order to merge the ICT with the functions of the public spaces. The project explores the new dynamics of open spaces as a trusted service for community and expands the understanding on how web-mediated public open spaces function, paying attention to the stakeholders, local context and different social groups. The article expands the co-creation research field and identifies key elements of digital co-creation for public spaces and communities. It proposes a typology of collaboration models between places, technology and people. This helps to explain how different technological, physical and social factors influence and shape the patterns of co-creative initiatives. The proposed framework combines the previous research efforts into a taxonomy which allows to assess and compare the digital co-creation initiatives.

2. Public Places and Communities at the Era of Digitalization

Public space is traditionally understood as an unbuilt space within the urban fabric accessible for all under the same conditions, regardless their private or public ownership [1]. However, a place also embodies multiple physical and social meanings. Public spaces are an important part of urban democracy and inclusiveness because they enable collective usage and reflection. Widespread digital networks enable networked society where localities can be connected through the web. When most social and economic activities can happen online and one can virtually be in different places at the same time the locality of a place seems to be neutralized. In the same manner, technological advances have ignited a debate into the nature of community. With the help of ICT, the notion of community denotes both physical and social conditions. Innovative communication technologies are driving out the traditional conviction that the communities can only be formed locally [2]. Online social networks, such as Facebook or Quora, enable people to connect and cluster worldwide based on their interests. According to the authors of [3] (p. 489), "a sense of place is no longer something that comes with simply spending time in a place, like by living in it, because today, people might live in one place but carry out most of their social engagements in other places".

Such discourse on the consequences of digitization to communities can seem worrying in the sense that the lure of ICT "will withdraw people from face-to-face contact and further disconnect them from their families and communities" [2] (p. 195). The authors of [4] also argue that online connections are intrinsically weak and brief because they do not support the stronger relationships. However, creative and thought-through use of digital technologies might strengthen the communities and enhance the public spaces. According the authors of [5], (p. 2), "social and everyday life has rediscovered the need for bodily presence, for sensory experience of real spaces < . . . > For instance, virtual education has enhanced rather than replaced traditional classroom-based education". Digitization also leads to modern bottom-up initiatives where the citizens and civic organizations voluntarily lend their talent and resources to help the governmental and public entities to enhance the public spaces and solve other societal problems. This approach is intrinsically user-oriented because it helps to people and organizations to promote their own decisions, create new tools, develop capacities for self-government and open-ended civic processes, rather than to ask people to participate to existing initiatives.

In the private sector, digitally induced shift to user-centricity has been conceptualized under such approaches as Service-Dominant Logic and Open Innovation 2.0. Public sector conceptualizes the change through the New Public Governance and Open Government paradigms and suggest that the public value is no longer created by the governments alone but in collaboration between public entities, private sector, civil society organizations and citizens. While the traditional approaches to public engagement and governmental transformations remain relevant, this article focuses on the growing potential of networked urban communities and digitally enabled co-creation to solve the social problems. It is driven by the increased innovative use of ICTs such as social media or coding platforms and changed expectations of citizens towards the interactivity and the public services [6]. The expectations are raised due to the digital offerings by the businesses—it is getting easier to do things online (e.g., shop online, communicate online, work online) every day and the citizen are expecting the same simplicity, comfort, and integration of the government and the services they provide too.

Research literature on the engagement of various societal groups in the definition, creation and design of public spaces is rapidly expanding, but it is still chaotic and needs more structured and defined key concepts. The authors of the C^{3}PLACES research project offer to extend the traditional perspective towards communities and public spaces by offering a novel conceptualization of digital co-creation. Proposed digital co-creation framework suggests that ICT is a powerful tool allowing to combine dual nature of both public spaces and communities. Based on the analysis of the previous research, we offer a multidimensional framework of digital co-creation of public spaces which consists of digital space, physical space and social space (see Figure 1 below). The framework incorporates the findings of previous studies such as Collective Intelligence Potential Index [7], Quality of Experience framework [8], Social Networking

Adoption Model [9] and Dimensions of Space framework [10]. Theoretical and empirical argumentation of the framework is extensively described in the previous works of the C^{3}PLACES research group [11,12].
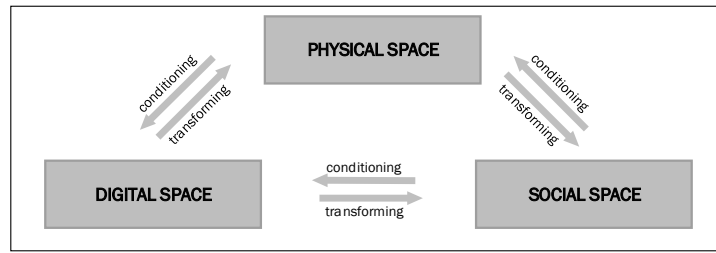

Figure 1. Multidimensional Framework of Digital Co-Creation of Public Spaces (C^{3}PLACES).

The physical space refers to the physical and functional conditions that make a place attractive by generating social integration and pleasure to involved communities. Digital space refers to the digital tools employed by the communities. It explains the technological readiness of the place for enabling co-creation and preconditions for the inclusiveness of public places. Social space refers to the communities, both localized and online, surrounding the public spaces. The different spheres of the spatial model are interdependent—they condition and transform each other. The capacity of the digital co-creation depends on their synergy. Digital co-creation refers to the local and digital communities hybridizing different domains of knowledge, concepts, languages and practices enabled by ICT through collective actions to spark transformations in public spaces.

3. Data and Methods

The intent of the mapping exercise is not to generalize the population of digital initiatives but to develop an in-depth exploration of the central phenomenon of digital co-creation by discerning the patterns in enhancing the public spaces (see Figure 2 below). Hence, the goals of the empirical investigation are two-fold. First, to develop insights on the involved actors, type of co-creative activities and objectives and to determine the linkages and synergy between the actors involved. Second, the study aims to get insights on the landscape of digital co-creation of public spaces and note the patterns of co-creation through intense study of particular co-creation cases. The mapping exercise was conducted using a web-based monitoring technique in order to build in-depth studies of digital initiatives. The process was divided in to four phases: development of research instrument, the identification of the sample of cases, the data collection, the evaluation and synthesis of results.
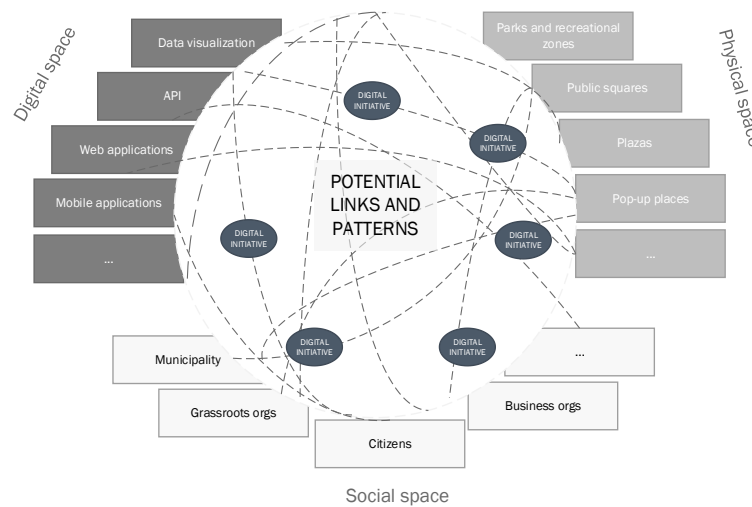

Figure 2. Patterns of Digital Co-Creation.

During the first phase, the research instrument—a data collection template—was developed based on the proposed conceptual framework (See Table 1 below). A data collection template makes the web-based monitoring process uniform and allows to discern the collaboration patterns between places, people and technologies. The template is divided into three sections: physical, digital and social spaces. In order to fulfil the overall project's goals, it was necessary to define the categories where the contribution of the ICT realm to the improvement of public open space is clearly identifiable. In addition, the availability of required content influenced the selection of the categories. During the phase two, sample cases were selected for the mapping research. To avoid contextual bias, the sample of initiatives was selected in unified context. The city of Vilnius, its public spaces and digital initiatives aimed at their advancements were analyzed. Vilnius is one of the fastest growing cities in Northern Europe. It is also a hub for political, economic, social and environmental change in Lithuania and the region as a whole [13]. The platforms in the sample were selected according following content criteria: (1) ICT-enabled and interactive. The platforms employ information and communication technologies to be more open, inclusive and collaborative; (2) Based in Vilnius. The platforms geographically originate in Lithuania; (3) Contributors. Selected platforms have capabilities to involve large number of members; (4) Data availability. Goals, metrics, initiators are listed on the website; (5) Collective action. Projects allows collaboration between different societal groups; (6) Orientation. Communities oriented towards development and usage of public spaces. The sample was gathered though the review of previous studies on digital platforms, municipal websites, popular blogs and through original Google searches on array of digital engagement related terms in Lithuanian. Based on the listed criteria, the sample case studies include 10 online initiatives oriented towards improvement of public spaces in Vilnius:

P1—Archmap (http://archmap.lt). Interactive architectural map of Lithuania containing information on architectural objects of the Independent Lithuania (since 1991). Initiated by Non-Governmental Organizations ("Architectural Centre", Lithuanian Architects' Union "Architekturos Fondas").

P2—Knygon.lt (http://knygon.lt). Interactive map visualizing the references to Lithuanian landmarks from fiction books. Initiated by individual citizens.

P3—kurGyvenu.lt (https://kurgyvenu.lt). Online project that provides key information on real estate and quality of life in Vilnius (and other cities globally). Initiated by business organization (UAB "CodeIn").

P4—Lietuvon.lt (http://lietuvon.lt). Interactive travel map marking Lithuanian heritage, landmarks and public spaces worth visiting. Initiated by individual citizens.

P5—Mes darom (http://mesdarom.lt). Annual event focused on cleaning the environment and public spaces. Supplemented by active social media campaign and interactive map. Initiated by NGO (VšĮ "Mes Darom").

P6—Pamatyk Lietuvoje (https://www.pamatyklietuvoje.lt/map). Interactive map visualizing and collecting information on Lithuanian heritage, touristic spots and public spaces. Initiated by citizens (four IT professionals and travel enthusiasts).

P7—Tvarkau Vilnių (https://tvarkaumiesta.lt/). Platform for easier reporting of minor problems in Vilnius municipality (potholes, broken benches, etc.). Initiated by governmental org (Vilnius City Municipality).

P8—Vilnius Talking Statues (http://www.mmcentras.lt/projects/). Digitalized stories about statues in the heart of Vilnius animated with the text and voices. Initiated by public organization (MO museum).

P9—VilniusGO (http://www.vilniusgo.lt). Presents cultural, historical and natural objects of Vilnius. Includes less popular objects, away from city center. Initiated by public organization (Central Library of Vilnius City Municipality).

P10—Vilnius Literature (http://www.vilniusliterature.flf.vu.lt). Literary cartography of Vilnius. Initiated by public organization (Vilnius University).

Table 1. Dimensions of Data Collection Template for Digital Co-Creation Framework.

Analysis Dimensions and Categories		Research Questions, Sub-Categories and Definitions
Physical Space	Type of space	What type of spaces the digital initiative involves? Description of subcategories: streets, parks, bike paths, streetscapes, recreation areas, green spaces, public squares, plazas.
	Level of interactivity	How the communities interact with the public space? To what extent the influence can be excreted? What is the context where the corresponding experience of interaction with the place occurs? Description of subcategories: physical world (interactions happens on site by employing augmented reality tools or mobile applications), virtually reproduced world (interaction happens in virtually augment environment), media world (interaction happens by voting, liking and exploring public spaces without actual visit to the site).
	Relations to the community	What are the relations between the community and the public space? Description of subcategories: enhancing the public space, exploring the public space, supporting the public space.
Digital Space	Extent and type of tools used	What digital medium and applications are used? Description of subcategories: data visualization platforms, gov. communication platforms, group decision-making platforms, issue reporting platform, mapping platforms, online learning platforms, opinion-matching platform, petitioning platforms, resource sharing/matching platforms.
	Tools	What tools are used as a base of the platform? Description of subcategories: Types: website, mobile app, website + mobile app, network.
	Open data	Does the platform employ open data? Description of subcategories: yes/no
	Open source	Does the platform share its code? Review of platform content and activity on Github and other open-source sharing services.
Social Space	Social orientation	What are the goals the platforms are trying to achieve? Description of subcategories: Official goals stated on the platform website were added to the template.
	Users	What types of users the platforms are trying to reach? Description of subcategories: NGO's, governmental organizations, public organizations, international organizations, associations, business users, media, citizens.
	Initiators	Who initiates the digital initiative? Description of subcategories: NGO's, business organizations, governmental organizations, public organizations, individuals.
	Partners, stakeholders	What is the number and type of partners/stakeholders the platforms identify on their platform? Description of subcategories: NGO's, governmental organizations, public organizations, international organizations, associations, business users.

Third phase refers to the data collection. The fieldwork was done in the period of December 2017–February 2018 by the C^{3}PLACES research group in Vilnius. Empirical data was collected through the website content analysis and by contacting the platform initiators where the data was not available publicly. Website content analysis provided quantitative data on various aspects of website content, features and the presence of web analytic code. The content analysis was conducted according following procedure. Firstly, to gain a broad view of all the platforms, extensive notes were written down while going through the basic procedures of using the platforms (both web- and mobile-based) for example logging in, filling out profile information and providing input. Later, each platform was studied in more detail to collect information for the data collection template. After collection of data online, e-mail inquiries were sent to platform initiators regarding the missing data. The phase also included the systemic coding of textual content and semantic themes found on the platforms by reviewing uploaded documents, outgoing links, social media accounts, user activity and media. The template and the monitoring procedure applied allowed to structure unstructured online data.

The last activity was to summarize was to summarize the findings of all the subjects and draw conclusions on the patterns of digital co-creation. The data collected allowed the research group to build in-depth profiles of digital platforms. Comparison of the research data across the cases led to the generation of the insights on the dynamics of digital co-creation initiatives. The data were analyzed and compared between the cases to discern digital co-creation patterns by following information, collaboration and communication flows. Such content analysis enabled the breakdown of large amounts of data into categories and helped to identify the important concepts from the material. Co-creation here refers to the existence of formal and/or informal relationships between the digital platform initiators and their external partners where there is some degree of coordination towards common goals.

The described method has several limitations which need to be mentioned. The first limitation is the heterogeneity of Internet data which predetermined by the differences in content, user interfaces, semantics, structure, etc. The differences make it difficult for the researchers collecting online data [14]. Another limitation is the sample of platforms, due to its limited size, it does not present statistical significance. However, as the first exercise in differentiating the patterns of digital co-creation in enhancing the public spaces, it can be considered as an effort of structuring the sample. Further research on larger sample of platforms in several countries could allow building a more representative sample.

4. Results

The data collected provided insights on how different technological, social and physical factors of public spaces influence and shape the patterns of co-creative initiatives. Before discussing the results, it is important to note, that the platforms in the sample have some non-descriptive qualities in number of template categories—type of spaces involved, open source and tools. Data collected on these categories proved to be irrelevant in discerning the patterns. Nevertheless, they allowed to evaluate the context and content of co-creative processes.

The first theme of the analysis framework—space dimension—consisted of content describing the physical aspects of digital co-creation initiatives. The results (see Table 2) allowed to indicate the relationships of the place with the digital and social reals. The platforms in the sample deal with a wide range of public spaces. With the exception of P5 that concentrates on green urban spaces and P8 that focuses on the spaces surrounding statues. The level of interactivity allowed to understand how the public (locals and/or tourists) interact with the public space through ICT i.e. how tools help to enhance the communication. The majority of cases (P1, P2, P3, P4, P6, P9) employ digitalized media world in the form of interactive maps, visualized data. The interactions mostly happen without actual visit to the public space. P8 uses augmented reality tools in mediating the relationships between the space and the people. It allows the public visiting spaces to interact with the objects by using mobile device. Real time interaction in physical world are apparent in cases P5 and P7. Here the public is actually visiting the place and have real-life interactions in the forms of cleaning the place

or documenting the problems. The relations between the communities and spaces were expressed in three ways—communities contributing and getting information (P1, P2, P3, P10), communities getting information/exploring (P4, P5, P6, P8) and communities enhancing places in form of ideas, complaints and/or suggestions (P7, P9).

Table 2. Results Summary of Space Dimension Investigation.

Code	Type of Space	Level of Interactivity	Relations to the Community
P1	Range of public spaces related to architectural heritage	Media world (interaction happens by liking and/or exploring public spaces on interactive map without actual visit)	Community can contribute to the platform by submitting entries and gain insights on the public spaces
P2	Range of public spaces related to literature heritage	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can contribute to the platform and gain insights on the public spaces
P3	Range of public spaces related to living houses in urbanareas	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can contribute to the platform and gain insights on the public spaces
P4	Range of public spaces related to tourist attractions	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can explore public places by analyzing digital content
P5	Range of green public spaces	Physical world (interactions happen on various sites by cleaning the environment)	Community can explore public places by analyzing digital content
P6	Range of public spaces related to tourist attractions	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can explore public places by analyzing digital content
P7	Range of public spaces in urban areas (streets, sidewalks, green areas)	Physical world (interactions happens on site by documenting the problems that need to be addressed and submitting to the platform)	Community can provide inputs in form of ideas, complaints and/or suggestions to enhance the public spaces
P8	Statues in public spaces of Vilnius	Virtually reproduced world (interaction happens through virtually augmented reality)	Community can explore public places by analyzing digital content
P9	Range of public spaces (tourist activities)	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can provide inputs in form of ideas, complaints and/or suggestions to enhance the public spaces
P10	Range of public spaces (related to literature heritage)	Media world (interaction happens by liking and/or exploring public spaces without actual visit)	Community can contribute to the platform and gain insights on the public spaces

The second, digital space, dimension considers technological readiness of the place for enabling co-creation (see Table 3). The range of digital tools used in the sample platforms is quite limited. Most of the platforms (P1, P2, P3, P4, P5, P6, P9, P10) use mapping and visualization applications to gather and disseminate content. Also, the majority of platforms use website-based applications. Opening of government data has been named as one of the most important catalyzers of the smart city and civic tech movements, thus data was collected in order to find out the prominence of open data usage. Only P3 and P7 take advantage of available open data. In addition, by using open source code the platforms can have more insights when designing tools suitable for their user groups and the initiators can use code created by other organizations and save valuable resources and time. However, the cases in the sample have not used the benefits offered by open source applications.

Table 3. Results Summary of Digital Dimension Investigation.

Code	Extent and Type of Tools Used (Illustrative Quotes *)	Tools	Open Data	Open Source
P1	Mapping and visualization platform. Used to compile and spread knowledge on architectural heritage ("you can briskly discuss on today's topicalities of architecture, comment, vote, and make a collection of your favorites")	Website	No	No
P2	Mapping and visualization platform. Used to compile and spread knowledge about Lithuanian heritage and its connection to public spaces.	Website	No	No
P3	Data visualization platform. Used to translate otherwise hard to understand information about public spaces to the users.	Website	Yes	No
P4	Mapping platform used to gather and disseminate content on tourist attractions	Website	No	No
P5	Mapping platform used to form communities around public spaces needed to be cleaned	Website	No	No
P6	Mapping platform used to gather and disseminate content on tourist attractions	Website	No	No
P7	Issue reporting platform. Used to communicate the problems to municipality in form of photo and text submissions.	Mobile app	Yes	No
P8	Augmented reality application used to disseminate content on statues in public places.	Mobile app	No	No
P9	Mapping platform used to gather and disseminate content on tourist attractions	Website	No	No
P10	Mapping and visualization platform. Used to compile and spread knowledge about Lithuanian heritage and its connection to public spaces.	Website	No	No

* illustrative quotes from platform content were used when available.

The social space refers to the co-creative maturity of actors in responding to the social challenges and in generating the public value an evaluated through social orientation, relations to users, partners and stakeholders. Initiators of the projects are listed in Section 3 of this article next to the description of the sample.

The content analysis of the user groups (See Table 4) shows that, in most cases, initiators define the user groups employing very abstract terms. Majority of platforms listed citizens ("commoner", "locals", "habitants") of Vilnius as the main user groups of their platforms. The applications with the scope wider than Vilnius use similar vocabulary to define their users. Wider spectrum of users is missing, businesses, governmental organizations and other types of users mention only in few instances. Platform analysis by the social orientation expressed through their goals revealed that most of the digital initiatives focus on the disseminating information about localities (P1, P2, P4, P6, P8, P9, P10). Only few offer other engagement opportunities—"inform authorities" (P7), "preserve public spaces" (P5) and "make easier decisions" (P3). The partner analysis was conducted by analyzing the content of the platforms and public documents provided by the initiators. Partner analysis shows that platforms identify non-profit organizations and governmental entities as partners the most.

Table 4. Results Summary of Social Dimension Investigation.

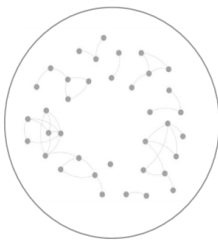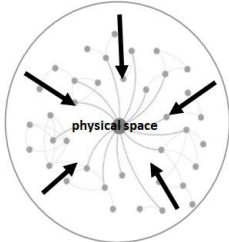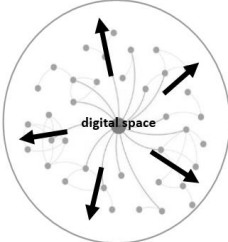| Code	Social Orientation *	Users *	Partners, Stakeholders
P1	"Promoting public *interest* in modern architecture, to evoke everybody's desire to deepen their knowledge about it, and to develop the cultural—architectural—tourism"	"Professionals and amateurs, young and old, everybody"	Gov orgs, business, NGOs (5 partners)
P2	"To increase *interest* in Lithuanian literature and hidden travel gems in our country"	Book fans and travelers	Lietuvon.lt, teachers of Lithuanian language (4 partners)
P3	"To help the owners, sellers, buyers, brokers, renters and other interest parties to make real-estate related decisions easier and more intelligent"	"Owners, sellers, buyers, brokers, renters and other interest parties"	N/A
P4	Introduce *interesting* Lithuanian travel spots in visual and collaborative map	"Travelers, teachers, lecturers, travel guides, families . . . "	N/A
P5	"Creation of sustainable society by uniting society to preserve the country and public spaces for future generations"	"Individuals, communities, governments, business, initiatives."	Media orgs, NGOs, business orgs, public orgs (20 partners)
P6	"To motivate and stimulate internal tourism, find new interesting spaces, share the knowledge and experiences"	"Everyone interested in travelling"	Public orgs, NGOs, gov orgs (6 partners)
P7	"The function of app is to quickly inform authorities about problems in the city"	Habitants of Vilnius	N/A
P8	"Share their intriguing stories"	Tourists and locals	N/A
P9	"Does not limit its scope to well-known objects in Vilnius, but popularizes less important spaces"	"Commoners of Vilnius"	Gov orgs, educational orgs, business (5 partners)
P10	"Our goal is different, for we see literature mapping not as armchair journey through a fictitious geography of Vilnius but as an invitation to walk the city with the eyes of a stranger."	"Book fans and explorers"	N/A

* Illustrative quotes from platform content were used when available.

5. Findings and Discussion

This research activity was designed to bring insights on patterns in digital co-creation of public spaces to the surface, rather than to test firm hypotheses. The aim of the article has not been to explicitly test existing theoretical models. Instead, theory has rather been applied to empirical data in order to generate a theoretically informed interpretation of empirical data. The models of collaboration differ on actor dynamics, co-creative activities and linkages between dimensions of proposed conceptual framework. The dynamics of collaboration models are summarized in Table 5 and explained below in relation to the research results.

The first type of collaborative pattern identified during the mapping exercise is the *scattered* model. The model centers around shared activities, goals or values that are key to the community surrounding the platform. The involved actors have loose associations with one another but strong relation to the common interest. This is most accurately expressed in the cases P2 and P10 where a mutual passion for literature unites actors in enhancing the public spaces through the use of collaborative and interactive mapping. As in the cases P1 and P3 where shared goal unifies communities through the use of ICT. In the second, *star-shaped* model of collaboration, community in digital co-creation cases presents a star-shaped structure involving a central entity—the public space. Actors and stakeholders surrounding the place have strong connections to the place but weaker associations with one another. This is best expressed in platforms P7 and P9 that have a common goal of improving the quality of life in Vilnius. The people focus on the physical element through digital tools but do not form social connections. The core of third type, *broadcast* model, is digital space. The digital platform serves as a broadcast to spread the information, content and knowledge on enhancing public spaces. The digital tools (as in cases of P4, P5, P6 and P8) allow for organizing communities to enhance physical spaces.

Table 5. Structure of Different Collaboration Models.

Description	Scattered Model	Star-Shaped Model	Broadcasting Model
Purpose	Learning, sharing, creating knowledge	Accomplishing a common goal	Spread of information and content
Physical space	Physical spaces are the object of common interest	Public space is a central figure	Enhancement of public space is the end result
Digital space	Medium to disseminate the content	Provide a medium to solve a common problem without constants of time and place	Digital platform is core
Social space	Loose associations, but strong common interest between actors	Strong connections to the place but weaker associations with one another	Communities are formed around the digital platforms

The article summarizes current research progress and condenses the multi-dimensional realities for decision-makers in enhancing public spaces and maintaining urban communities. The empirical mapping exercise allowed to create a typology of digital initiatives based on the characteristic of the way in which the collaboration flows are structured. Proposed typology framework gives an overview of the state-of-art in the interaction between people, places and technology. Such typological models are illustrative of the ways in which co-creative initiatives can be designed and managed. It also proposes a basic typology of the ways in which different models' digital co-creation could facilitate different types of value production in enhancing the public spaces. Further research exploring these digital co-creation platforms in greater depth and applying comparable methods in other countries, would be useful to confirm or question proposed methodology. With an intention to provide the guidance on evaluation of ICT-enabled initiatives in terms of digital co-creation design and implementation the research team published a set of complimentary documents in a form of guidelines for digital initiatives commenced by citizens, governmental entities, public institutions, business organizations on the project website (www.c3places.eu).

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References

1. Costa, C.S.; Ioannidis, K. *The Making of the Mediated Public Space: Essays on Emerging Urban Phenomena*; Centro de Estudos Interdisciplinares em Educação e Desenvolvimento: Lisboa, Portugal, 2017.
2. Hampton, K.; Wellman, B. Examining Community in the Digital Neighborhod: Early Results from Canada's Wired Suburb. In *Digital Cities: Technologies, Experiences, and Future Perspectives*; Ishida, T., Isbister, K., Eds.; Springer: Heidelberg, Germany, 2000; pp. 194–208.
3. Abdel-Aziz, A.A.; Abdel-Salam, H.; El-Sayad, Z. The role of ICTs in creating the new social public place of the digital era. *Alex. Eng. J.* **2016**, *55*, 487–493. [CrossRef]

4.   Gladwell, M. Small change: Why the revolution will not be tweeted. *The New Yorker*, 28 September 2010.

5.   Battistella, M. Digital Social Tools for the City. *Ecosistema Urbano*. 28 November 2013. Available online: http://ecosistemaurbano.org/english/digital-social-tools-for-the-city-l-new-series-social-toolbox/ (accessed on 19 March 2018).

6.   Borras, J.; Brown, P.F.; Parker, C. Transformational Government Framework Version 2.0. 2014. Available online: http://docs.oasis-open.org/tgf/TGF/v2.0/cs01/TGF-v2.0-cs01.pdf (accessed on 1 February 2018).

7.   Skaržauskienė, A.; Ewart, J.; Krzywosz-Rynkiewizc, B.; Zalewska, A.; Leichteris, E.; Mačiulis, A.; McLean, H.; Mickunas, A.; Mikulskienė, B.; Paražinskaitė, G.; et al. *Social Technologies and Collective Intelligence*; Mykolas Romeris University: Vilnius, Lithuania, 2015.

8.   Möller, S.; Raake, A. *Quality of Experience-Advanced Concepts, Applications and Methods*; Springer: Cham, Switzerland, 2014.

9.   Griggs, K.; Wild, R. A Social Networking Adoption Model for Communication and Collaboration in e.Government. In Proceedings of the 13th European Conference on eGovernment, Como, Italy, 13–14 June 2013; pp. 221–229.

10.   Project for Public Spaces, What Makes a Successful Place? 2009. Available online: https://www.pps.org/reference/grplacefeat/ (accessed on 20 December 2017).

11.   Mačiulienė, M.; Skaržauskienė, A. Conceptualizing ICT-Enabled Co-creation of Public Value. In Proceedings of the 4th International Conference, INSCI 2017, Thessaloniki, Greece, 22–24 November 2017; pp. 93–100.

12.   Skaržauskienė, A.; Mačiulienė, M.; Botteldooren, D. Methodology for Co-Creating Public Open Spaces. In Proceedings of the 8th GIKA Digital Transformations and Value Creation in International Markets, Valencia, Spain, 25–27 June 2018.

13.   The New Economy, Vilnius Becomes One of Europe's Smartest Cities. 2014. Available online: https://www.theneweconomy.com/business/vilnius-becomes-one-of-europes-smartest-cities (accessed on 1 March 2018).

14.   Bouchkhar, B. Data sources on the Internet: Towards a new and innovative solution. In *NTTS 2013*; European Commission: Brussels, Belgium, 2013; pp. 391–397.