Article

A Classification of Digital Platforms Applied to the Governance of Smart Cities

Lucas Carvalho Ferreira [1], Ieda Kanashiro Makiya [2] and Francisco Giocondo Cesar [3,*]

[1] State University of Campinas; csf.lucas@gmail.com
[2] State University of Campinas; iedakm@unicamp.br
[3] State University of Campinas; giocondo.cesar@gmail.com
* Correspondence: csf.lucas@gmail.com

Abstract: This research seeks to understand the impact of digital platforms on the governance of smart cities. It uses the Scaffold of Popular Participation to classify digital platforms and better understand participatory governance in cities, its benefits and complications, correlating them with the SDGs of the 2030 Agenda. It was also possible to list points of attention for the development of digitization in the public sector, including in Brazil. It concluded that the digitization of public services is in progress, pressured by the civil body for greater transparency and participation. In addition, the platforms must be guided by civil inclusion in the discussion of public policies, by the training of intelligent citizens and by sustainable guidelines that guide the themes addressed. In contrast, platforms can also facilitate deception and popular manipulation, which represents a high risk if used for this purpose.

Keywords: smart cities; smart citizen; public governance; digital platforms; citizen participation

1. Introduction

Before a scenario of urban complexification, with increased formation of megacities and their economic, social, and environmental consequences [1, 2, 3, 4, 5], the Sustainable Development Goal 11 (Sustainable Cities and Communities) holds public, private, and civil associations responsible for the governance of urban infrastructure, quality of life, security and physical accessibility, and basic resources to all citizens. SD 11.3 particularly concerns the planning capacity of communities and their participatory, integrated, and inclusive management [6].

Applying Information and Communication Technologies (ICTs) in cities has shown to help achieve the goals proposed by the UN. Using the connectivity of digital platforms, ICTs can make decision-making in public administration more responsive, transparent, collaborative, integrated, and efficient [7]. This digitalization of the city for a better governance is one of the basic foundations of the concept of Smart Cities, already being applied and improved in communities of different countries [8].

In Brazil, a bill is being processed for the implementation of Smart Cities [9]. The PL 976/2021 aims to prioritize federal technical and financial support to municipalities that adopt the solutions of the National Policy of Smart Cities. ICTs are one of the target dimensions of this plan, precisely because they offer digital services, data promotion, and information as part of the solution. Moreover, their definitions often include the co-creation of solutions by different parties articulated in digital platforms.

Brazil, however, faces challenges in the structuring and governance of its urban areas. The country has 5,568 municipalities, many of which lack some type of basic infrastructure [10]. Nevertheless, 81% of the Brazilian population aged 10 years or older and 83% of households are estimated to be connected to the Internet [11]

Considering the opportunities to improve national urban areas and the potential of digital platforms as a tool for governance and focus of national investment, we must understand how platforms have been applied for more transparent, participatory, and

 doi:10.20944/preprints202212.0227.v1

inclusive governance in Brazil and worldwide to direct impact investments for developing solutions. Bibliographical research was conducted on the Web of Science platform on August 19, 2021 for articles with the words "platform" and "governance" in their titles. In total, 157 articles were found. After reading the abstracts, 79 of the articles were considered of interest to the research. The information was complemented by an initial search conducted on June 17, 2021 on the same platform for articles with "smart cit*" "platform," and "governance" as keywords. Definitions and directions structured from the articles studied are presented below.

1.1. City governance

The conceptualization of governance methods has been discussed in the scenario of political, social, economic, and environmental crises experienced in recent decades [8]. The current academic definitions of public governance include balancing conflicts of interest between the various urban actors and responsibly guaranteeing the quality of services offered to the population, inclusively and collaboratively [12]. This governance model advances towards the self-management of actors, in which the government is no longer responsible for imposing or limiting decisions but for regulating and directing projects for a common goal.

1.2. Digital Platforms

Poell, Nieborg, and Van Dijck [13] define platform as "(re-)programmable digital infrastructures that facilitate and shape personalized interactions among end-users and complementors, organized through the systematic collection, algorithmic processing, monetization, and circulation of data".

The data generated by these interactions have an important market value for the strategic designs of companies, which can put large private companies in control of critical sectors such as health [14]. Moreover, a variety of platforms under the domain of a few companies can tend to create global data monopolies that are also relevant for urban management [15]. The complexity of platforms and other ICT also encompasses the cultural and social impacts of connectivity or lack thereof [16, 17].

1.3. Smart Cities

In short, Repette et al. [7] argue that for a city to be considered smart, it must have a connected infrastructure and a strategic vision that will define guidelines for applying inclusive and sustainable long-term solutions. The authors also argue that technology does not replace human responsibility in the design of this planning and in the execution of conclusions.

1.3.1. Use of digital platforms in Smart Cities

Platform use for urban management is a new theme, which is beginning to be discussed [18] and is motivated by the notion that the conventional form of governance, centralized and hierarchical, cannot solve today's complex urban problems [7, 8]. These platforms have been developed by private companies as a tool for managing data and disseminating information of public interest. Some also seek decentralized governance as they are structured [8, 19].

However, due to their business focus, market platforms are insufficient for application in public management, where specific conflicts of interest occur [20]. They cannot achieve scalability since they disregard the specificity of each site and stray from the urban strategic planning in question [21]. In this sense, the platforms contradict the goals of Smart Cities.

To be functional, the platforms must be inclusive and deliberative, involving many actors and guaranteeing the discussion among parties to solve problematic situations [20, 22]. Ensuring the safety and privacy of users [7, 22] and conducting a project for their implementation is essential. One must first structure the internal digital communication of the local administration, then solidify a reliable external communication structure, and

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 13 December 2022 doi:10.20944/preprints202212.0227.v1

finally open the channel for civil, business, and third sector engagement in discussing problems and possible solutions [23, 24].

Concisely, platforms process information that can result in a complex analysis to govern the different public sector fronts (Figure 1).

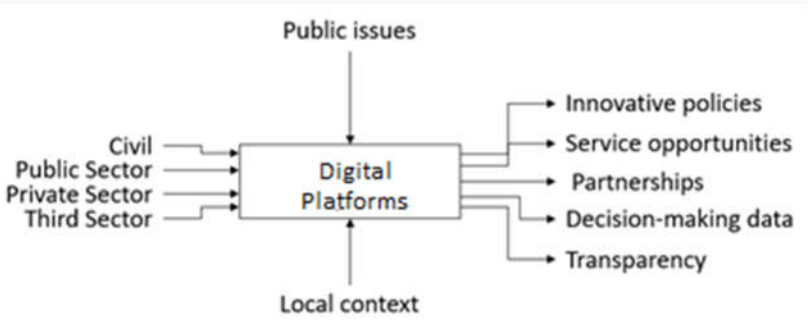

Figure 1. Scheme for the operation of platforms for public governance [23, 24].

1.4. Arnstein's ladder and participatory governance

Since the effectiveness of the platforms is directly related to the level of popular interaction, some methodologies that evaluate this performance were studied [20, 22, 23, 24, 25, 26].

One methodology started from a lean model already validated by academic critics: the Arnstein Ladder of Civil Participation [27]. The model was updated by Cardullo and Kitchin [25] for Smart Cities standards. Figure 2 shows the possible classifications of the platforms.

The ladder in Figure 2 allows classifying the intensity of popular power in decision-making of public planning and programs (determination of the final product) [25]. The classification starts with eight subclassified steps in three degrees. The "non-participation" level offers channels of communication between society and a popular representative in which the representative manipulates the population. In "tokenism", a superficial effort is made to communicate with the population without representativeness and sometimes to listen to them. Finally, in "civil power", the population has a significant participation in the decision-making of public authorities [27].

Other subclassifications also help understand the function that local government expects citizens to develop, the level of involvement that citizens perceive, the discourse that local government uses via these platforms, and the mode of governance for each level – whether top-down or bottom-up.

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 13 December 2022 doi:10.20944/preprints202212.0227.v1

Form and Level of Participation		Role	Citizen Involvement	Political discourse/ framing	Modality
Citizen Power	Citizen Control	Leader, Member	Ideas, Vision, Leadership, Ownership, Create	Rights, Social/Political Citizenship, Commons	Inclusive, Bottom-up, Collective, Autonomy, Experimental
	Delegated Power	Decision-maker, Maker			
	Partnership	Co-creator	Negotiate, Produce	Participation, Co-creation	
Tokenism	Placation	Proposer	Suggest		Top-down, Civic Paternalism, Stewardship, Bound-to-succeed
	Consultation	Participant, Tester, Player	Feedback	Civic Engagement	
	Information	Recipient	Browse, Consume, Act		
Consumerism	Choice	Resident, Consumer		Capitalism, Market	
Non-Participation	Therapy	Patient, Learner, User, Product, Data-point	Steered, Nudged, Controlled	Stewardship, Technocracy, Paternalism	
	Manipulation				

Figure 2. Scaffold of popular participation classification [25].

2. Materials and Methods

Eleven digital platforms focused on public sector governance were surveyed. All of them have been critically analyzed by articles selected from the literature review. The selection criterion was based on the platforms that presented more detailed functionalities and greater topicality of information. Table 1 lists these platforms.

Table 1. Platforms surveyed during bibliographic review.

Country/City	Platform	Focus	Field of activity	Smart City field
Belgium/Brussels	Brussels by us	Local solutions	Social innovations	Being surveyed
Brazil/Curitiba	Curitiba App	Data	Service offering	Smart Governance
Canada/*	Vibrant Communities	Local Solutions	Poverty Reduction	Smart People
China/*	Green Commuting	Data	Health and environment	Smart Environment
United States of America	Challenge.gov	Local solutions	Social innovations	Smart People
United States of America	State Water Plan	Data	Environment	Smart Environment
Global/*	EPODE	Local solutions	Health	Smart Experience
Iceland/Reykjavik	Better Reykjavik	Local solutions	Social innovations	Smart People
Netherlands/Utrecht	(Under Development)	Data	Mobility	Smart Mobility
Russia/Moscow	Active Citizen	Local solutions	Social Innovations	Smart Living
Venezuela/*	SINCO	Local solutions	Poverty reduction	Smart Economy

In alphabetical order of the countries where they operate, the platforms were first classified according to focus. Platforms focused on local solutions have some kind of openness to acquire citizen information, opinions, or habits. Data-focused platforms, in turn, have no opening to exchange information with citizens, being only an informative channel. The area of operation of the platforms, which indicates which public sector is prioritized by ICT, was also considered. The platforms were, than, classified by the Scaffold of popular participation.

3. Results

Table 2 shows that the same platforms were located on a degree of the Arnstein's Ladder. They were ordered according to the level found in the Arnstein Ladder, based on

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 13 December 2022 doi:10.20944/preprints202212.0227.v1

the bibliographic references that address each of them. The classifications will later be discussed based on the article by Cardullo and Kitchin [25].

Table 2. Degree of classification in the Arnstein's Ladder and references used.

Country/City	Platform	Degree	Reference
Canada/*	Vibrant Communities	Partnership	[22]
Iceland/Reykjavik	Better Reykjavik	Partnership	[8, 22]
United States of America/*	Challenge.gov	Placation	[22]
Belgium/Brussels	Brussels by us	Consultation	[28]
Russia/Moscow	Active Citizen	Consultation	[29]
Venezuela/*	SINCO	Consultation	[30]
Brazil/Curitiba	Curitiba App	Information	[31]
United States of America/Georgia	IWRM	Information	[32]
Global/*	EPODE	Information	[22]
China/*	Green Commuting	Choice	[24]
Netherlands/Utrecht	(Under development)	Choice	[21]

2.2. Classification of platforms regarding Discourse and Citizen Involvement

Within the same degree of the Arnstein's Ladder, platforms can be more or less transparent about their actual function. The "Citizen Involvement" category of the ladder reflects the level of involvement that the citizen can practice in the platform. The "Discourse" category reflects what is the political discourse used to justify the various forms, levels, roles, and involvement of citizens [25]. The two classifications can be crossed as in Figure 3.

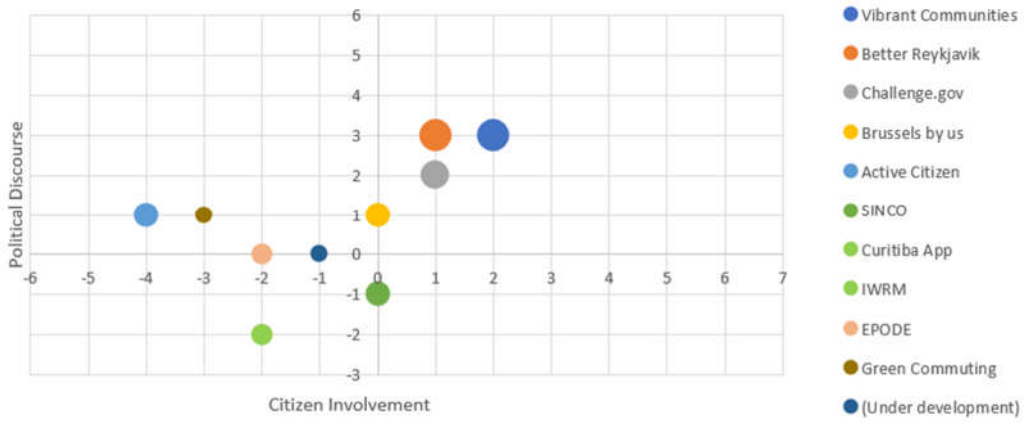

Figure 3. Discourse vs Engagement Chart.

The platforms were plotted on the chart according to the evaluations presented in Table 3. The horizontal axis refers to the level of citizen involvement allowed by the platform and the vertical axis to the discourse transmitted by the platform. The diameter of the points varies according to the degree of the platform in the Arnstein's Ladder.

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 13 December 2022 doi:10.20944/preprints202212.0227.v1

Table 3. Values assigned to Engagement, Discourse, and Degree levels.

Involvement	Value in x	Discourse	Value in y	Degree	Diameter
Creation	7	Rights Assurance	6	Citizen Control	9
Leadership	6	Citizenship	5	Delegated power	8
Consultation	5	Public guarantee	4	Partnership	7
Ideas	4	Co-creation	3	Placation	6
Negotiation	3	Participation	2	Consultation	5
Production	2	Citizen Involvement	1	Information	4
Suggestion	1	Market	0	Choice	3
Return	0	Paternalism	-1	Therapy	2
Consumption	-1	Technocracy	-2	Manipulation	1
Circulation/navigation	-2	Control	-3		
Act	-3				
Steered	-4				
Nudged	-5				
Controlled	-6				

This section may be divided by subheadings. It should provide a concise and precise description of the experimental results, their interpretation, as well as the experimental conclusions that can be drawn.

4. Discussion

4.1. Platforms classified as "Partnership"

The two platforms classified as "Partnership" were accessed virtually by the authors. They begin the opening to civil power, with a discourse of co-creation of solutions to social problems raised by the authors themselves. The Vibrant Communities platform stands out (Figure 3) by allowing citizens to produce the suggested innovation, unlike the Better Reykjavik platform, which limits citizens to suggesting solutions for the local government to develop proposals to predefined problems.

The Vibrant Communities platform allows a bigger engagement by promoting more structured data and training citizens to interpret these data and realize the social innovations that arise. Its structure also facilitates the work of co-creation, with specific forums and themes.

Both platforms have expressive numbers in an analyzed period of four years: 25 cities developing plans to increase civil engagement provided by Vibrant Communities [22] and more than 7600 projects implemented by Better Reykjavik in its session "My Neighborhood" [8]. They also value connectivity between different fronts, such as education, hunger, and poverty [22] or a wider variety of urban themes [22].

Regarding transparency, the Vibrant Communities portal discloses the already developed fronts, data reports, discussion events, and ongoing projects. It does not give access to financial resource allocations. The Better Reykjavík portal, in turn, allows easy access to projects ongoing or in development, showing how many solution ideas have already been submitted, the interactions, people involved, and project situation. It also shows the history of projects already completed. However, the portal presented no financial transparency. Importantly, the countries where the platforms operate are nations considered developed, with high quality of life and low poverty index.

These platforms improve the self-management of the actors, with fewer limitations imposed by the current government.

4.2. Platform classified as "Placation"

The platform Challenge.gov is a communication channel between the public agencies of the United States of America and citizens. In the platform, each agency can submit open-ended individual problems for citizens to propose solutions [22]. Each agency

 doi:10.20944/preprints202212.0227.v1

reviews the proposals and awards the winner. About 42 projects are currently open for submission of proposals [33] in various themes.

Citizens evidently have no freedom to suggest projects and are restricted to proposing developed solutions. The award for the winner is consistent with a speech of co-creation and participation, despite the top-down governance.

4.3. Platforms classified as "Consultation"

Three platforms were classified as "Consultation". All operate in a more closed way. A restricted technical team predefines the problems raised and evaluates the return given by citizens [28, 29, 30]. In the SINCO platform, citizens can submit project proposals, but always represented by local popular organizations, called OBPP (Popular Power Base Organizations). The platform claims to have already benefited 19 states and several communities, mainly focusing on the interconnection of food processing centers [34].

The Active Citizen platform incorporates different themes but which focus on short-term projects, such as leisure events, or of low impact, such as defining the color of a subway line [29]. Virtual surveys are conducted and do not present alternatives for citizens to oppose the project. Furthermore, all surveys present the option for an expert to define the project. Participating citizens may gain bonuses, allowing them to exchange accumulated points for leisure tickets, for example. Considering the aforementioned, the platform is a negative highlight since it induces citizens to believe that they are participating in public decision-making but only leads them to approve the projects. The graph in Figure 3 allows easily viewing this information.

All platforms classified as "Consultation" presented a top-down governance, in which the organization responsible for the platform is in control.

4.4. Platforms classified as "Information"

Three platforms fall under the "Information" classification of the Arnstein Ladder. All are administered by an organization that aims to provide information as a single means of communication. Both in the EPODE and IWRM platforms, the teams are restricted to professionals considered key to decision-making in the main theme of the platform. For IWRM, these professionals are large consumers of water resources, such as the agrarian and industrial sector, or public servants [22]. For EPODE, they are representatives of education, the health sector, the industry, and the media, also covering other institutions of the third sector [32, 36]. These are platforms of relative success: EPODE is present in over 167 French cities [36] and IWRM manages the 28 largest basins in the state of Texas [35].

Even more limited is the platform Curitiba App. It guarantees only access to news, social program registrations, reporting channels, and mobility information. The local government administers it while the city hall provides the news and information [31].

The lack of a channel for the expression of civilians shows the top-down governance in the platform. Citizens can only navigate the platform, acting as audience from the point of view of the organizations that administer it.

4.5. Platforms classified as "Choice"

The lowest level of platform classification was the "Choice" degree. Both platforms in this degree focus on mobility. Green Commuting is a gamefication of the way Chinese inhabitants move. Using financial and personal recognition for the ranking of users, the government encourages citizens to move in the most sustainable way possible, reducing the emission of greenhouse gases [24]. In turn, the platform under development in Utrecht aims to optimize the mobility of a developing smart neighborhood [21].

None of the two platforms allows citizens to discuss the problem for decision-making. Civilians have a role of navigator in the platform and inhabitant of the physical space. Top-down governance is evident, in which citizens are led to respect the decision-making of the government and/or private companies, with little to no interaction.

 doi:10.20944/preprints202212.0227.v1

Authors should discuss the results and how they can be interpreted from the perspective of previous studies and of the working hypotheses. The findings and their implications should be discussed in the broadest context possible. Future research directions may also be highlighted.

5. Conclusions

Digital platforms have received attention from country governments in different economic situations and levels of quality of life. Both private power and civilians are pressuring the government fronts to digitalize communication services and channels. Understanding how this digitization is done is essential since different platform structures can provide different levels of public governance.

Platforms allow creating collaborative and integrated solutions which favor the inclusion of civil representatives in managing urban problems. However, they can also limit the channels of communication between actors or access to data interpretation, strengthening both traditional and hierarchical governance as well as public management directed by private interests. Even in close socioeconomic contexts, such as those of Challenge.gov and IWRM platforms, these technologies can present different results according to their objectives and structures.

Developed countries were most examples of better placed platforms in the Arnstein Ladder, which could be an indicator of the lack of collaborative technologies for public management in Southern countries of the globe. Exploring more platforms from developing countries is essential to understand the form of governance these platforms achieve and possible alternatives for improvement. Considering the Brazilian framework specifically, the incentive promoted by PL 976/2021 could push the development of participatory platforms inspired by international practices. Moreover, internally structuring municipal governments and strengthening the responsive notion of civilians, providing training for awareness and civic engagement, as well as notions of public policies could all benefit this opportunity.

Finally, the Vibrant Communities and Better Reykjavik platforms show they can better meet the characteristics of participatory governance. However, even the top rated platforms have room for improvement, such as becoming more transparent about resource allocation and information security. Improving the architecture of the platforms, information security legislation, and the data domain itself, as developed by PL976/2021, is essential for the public sector to not become vulnerable and market-dependent for good decision-making. Citizens should be even more engaged in the projects of these platforms, deciding from the idealization of the projects developed on the platform. This section is not mandatory but can be added to the manuscript if the discussion is unusually long or complex.

References

1. Barlow, M.; Lévy-Bencheton, *Smart cities, smart future: showcasing tomorrow*; 1st ed.; Wiley: New Jersey, USA, 2019.
2. Christen, A.; Vogt, R. Energy and radiation balance of a central European City. *International Journal of Climatology* **2004**, *v. 24*, pp. 1395–1421.
3. Foley, J. A. et al. Global consequences of land use. *Science*. **2005**, *v. 309*, pp. 570-574.
4. Huo, T. et al. Nonlinear influence of urbanization on China's urban residential building carbon emissions: New evidence from panel threshold model. *Science of the Total Environment* **2021**, *v. 772*.
5. Roy, A. Regional Studies : the 21st-Century Metropolis. *New Geographies of Theory* **2009**, *v. 43*, pp. 819–830.
6. Sustainable Development Goals. Available online: shorturl.at/fsFIO (accessed on 08 Dec 2022).
7. Repette, P. et al. The Evolution of City-as-a-Platform: Smart Urban Development Governance with Collective Knowledge-Based Platform. *Urbanism. Land* **2021**, *v. 10*, pp. 33-57.
8. Gil, O.; Cortés-Cediel, M. E.; Cantador, I. Citizen participation and the rise of digital media platforms in smart governance and smart cities. *International Journal of E-Planning Research* **2019**, *v. 8*, pp. 19–34.
9. PL 976/2021. Available online: https://www.camara.leg.br/propostas-legislativas/2274449 (accessed on 08 Dec 2022).
10. Número de municípios, total e os com rede coletora de esgoto sanitário, e número de economias esgotadas ativas, total e residencial. Available online: https://sidra.ibge.gov.br/tabela/1359#resultado (accessed on 08 Dec 2022).
11. NIC.Br (org). Executive Summary: ICT Households Survey **2021**. Available online: shorturl.at/ARSY8 (accessed on 08 Dec 2022).

12. Walravens, N.; Ballon, P. Platform business models for smart cities: From control and value to governance and public value. *IEEE Communications Magazine* **2013**, *v. 51*, pp. 72–79.
13. Poell, T.; Nieborg, D.; Van Dijck, J. Platformisation: Internet Policy Review *Journal On Internet Regulation* **2019**, *v. 8*.
14. Marelli, L.; Testa, G.; Van Hoyweghen, I. Big Tech platforms in health research: Re-purposing big data governance in light of the General Data Protection Regulation's research exemption. *Big Data & Society* **2021**, *v. 8*.
15. Jin, D. Y. The Construction of Platform Imperialism in the Globalization Era. *Journal for a Global Sustainable Information Society* **2013**, *v. 11*, pp. 145–172.
16. Burgess, J.; Marwick, A.; Poell, T. The SAGE Handbook of Social Media Research Methods. 1st ed; London, UK, 2017.
17. Minoia, P.; Jokela, S. *Journal Of Sustainable Tourism* **2021**, *v. 30,* pp.951-965.
18. Haveri, A.; Anttiroiko, A. Urban platforms as a mode of governance. *International Review Of Administrative Sciences* **2021**, *v.0*.
19. Treude, M. Sustainable smart city—opening a black box. *Sustainability (Switzerland)* **2021**, *v. 13*, pp. 1–15.
20. Bellone, C.; Naselli, F.; Andreassi, F. New Governance Path through Digital Platforms and the Old Urban Planning Process in Italy. *Sustainability* **2021**, *v. 13*.
21. Van Den Hurk, M.; Pelzer, P.; Riemens, R. Governance challenges of mobility platforms: the case of Merwede, Utrecht. *European Transport Research Review* **2021**, *v. 13*, .
22. Ansell, C.; Miura, S. Can the power of platforms be harnessed for governance?. *Public Administration* **2020**, *v. 98*, pp. 261–276, mar. 2020.
23. Janowski, T.; Estevez, E.; Baguma, R. Platform governance for sustainable development: Reshaping citizen administration relationships in the digital age. *Government Information Quarterly* **2018**, *v. 35,* pp. S1–S16.
24. Ju, J.; Liu, L.; Feng, Y. Public and private value in citizen participation in E-governance: Evidence from a government-sponsored green commuting platform. *Government Information Quarterly* **2019**, *v. 36*.
25. Cardullo, P.; Kitchin, R. Being a 'citizen' in the smart city: up and down the scaffold of smart citizen participation in Dublin, Ireland. *GeoJournal* **2019**, *v. 84*.
26. Kang, J.; Wang, X. The Organizational Structure and Operational Logic of an Urban Smart Governance Information Platform: Discussion on the Background of Urban Governance Transformation in China. *Complexity* **2020**, *v. 2020*.
27. Arnstein, S. R. A Ladder Of Citizen Participation. *Journal Of The American Institute Of Planners* **1969**, *v. 35*, pp. 37–41.
28. Temmerman, L.; Veeckman, C.; Ballon, P. Collaborative governance platform for social innovation in Brussels. *Social Enterprise Journal* **2021**, *v. 17*, pp. 165–182.
29. Gritsenko, D.; Indukaev, A. Digitalising City Governance in Russia: The Case of the`Active Citizen' Platform. *Europe-Asia Studies* **2021**, *v. 73*, pp. 1102–1124.
30. Sanchez-Tortolero, R.; Marquez-Gonzalez, J.; Vernaez-Hernandez, G. Participation and Citizen Empowerment platform for e-governance: Communal Integration System (SINCO). *Proceedings Of The 12th International Conference On Theory And Practice Of Electronic Governance* **2019**. Broadway, New York, NY. USA.
31. Macke, J. et al. Smart city and quality of life: Citizens' perception in a Brazilian case study. *Journal of Cleaner Production* **2018**, *v. 182*, pp. 717–726.
32. Bell, E.; Scott, T. A. Common institutional design, divergent results: A comparative case study of collaborative governance platforms for regional water planning. *Environmental Science & Policy* **2020**, *v. 111*, pp. 63–73.
33. Challenge.org. Available online: https://www.challenge.gov/#active-challenges (accessed on 08 Dec 2022).
34. Buscar Proyecto Mapa. Available online: https://www.sinco.gob.ve/sinco/search/project/mapa/ (accessed on 08 Dec 2022).
35. Borys, J. M. et al. EPODE approach for childhood obesity prevention: Methods, progress and international development. *Obesity Reviews* **2012**, *v. 13*, pp. 299–315.
36. EPODE – Together Let's Prevent Childhood Obesity. Available online: https://epha.org/epode-together-lets-prevent-childhood-obesity/ (accessed on 08 Dec 2022).