Sociopolitical Digital Interactions' Maturity: Analyzing the Brazilian States

Completed Research Paper

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Abstract

In the context of the "network society" structured on "digital communication" processes, new values and technologies induce changes in government-society relations. The aim of this study was to propose a theoretical framework of understanding the levels of sociopolitical digital interactions' maturity (SDIM) in response to the following question: how can the sociopolitical digital interactions' maturity levels be classified? To conduct this study, a qualitative methodological approach was adopted. The content analysis of the 27 Brazilian states' government websites was structured on a theoretical scheme (SDIM), which allowed the verification and classification of digital interactive tools used in e-government portals. It was concluded that the levels of electronic interactivity do not represent institutional democratic development. Furthermore, if compared with Rio Grande do Sul's state government website, it seems that there is a long way to go with regard to electronic democracy development in the Brazilian states.

Keywords

Government 2.0, Citizen-centered government, e-Governance.

Introduction

In the "network society," which is structured on "digital communication" processes (Castells et al. 2000), core concepts of the Web, such as informational space and global, collaborative, and interconnected dynamics (Berners-Lee et al. 2000), became inherent to networks and induced changes in the institutional settings of states. This involved the development of new organizational models based on the orchestration of complex, open, and self-organizing systems. Such models are also based on the co-creation of results through partnerships with civil society (Mulgan 2006).

The increasing use of information and communication technologies (ICT) in governmental processes tends to guide policy and institutional innovations. Designs of sociopolitical interface compatible with collaborative, contributory, and community patterns (Andersen 2007) imply the remodeling of informational, legal, institutional, and technological structures of the state based on concepts related to Web 2.0, culminating in Government 2.0 (Chun et al. 2010).

Initiatives such as the Open Government Directive (U.S. Government 2009), the British government's Big Society program (Cameron 2010), and Singapore's eGov2015 Masterplan (Singapore Government 2013) are based on processes of democratic participation, transparency, connection, collaboration, and co-creation of public policies and values (Harrison et al. 2012).

The focus on digital channels of sociopolitical interaction encourages research on electronic tools and intersections between the interests and influences of various actors, from which conflicting and collaborative processes related to the public policy cycle are designed.

The goal of this research is to address the gap presented by Bonson et al. (2012) regarding the importance of analysis of government actions in the digital environment. Furthermore, this reiterates the gap pointed out by Cegarra-Navarro et al. (2012) in our understanding of ICT's impact on government-citizen relations.

The immediate objective of this work was to propose a useful theoretical framework (SDIM) both for conceptual reflections on the theme and for the analysis and design of electronic tools for government websites. Through the SDIM, the contents of Brazil's 27 state government websites were analyzed.

The central questions in this study were as follows: (1) how can the sociopolitical digital interactions' maturity levels be classified; and (2) what is the current developmental stage of digital sociopolitical interactions in Brazilian states' governmental websites?

The relevance of this research resides in the following: the possibility of using the SDIM framework for analyses of other governmental websites; its ability to guide the process of formulating digital tools' architecture in promoting sociopolitical interactions through the web; and the possibility of promoting discussions and exchanges between researchers and government agents.

This article is structured as follows: the methodological approach is defined after outlining the theoretical framework and presenting the conceptual scheme of SDIM. The 27 Brazilian states' government websites are then analyzed and final thoughts are offered on the points discussed.

Literature Review

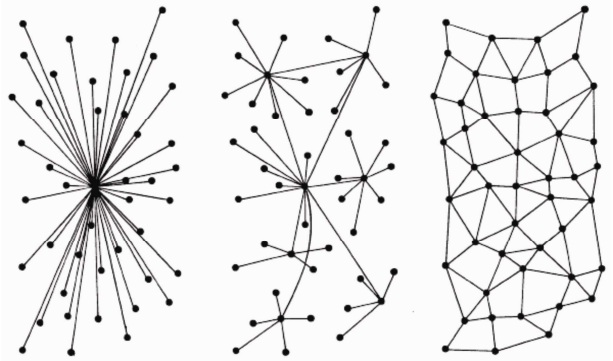
Network

Early studies of intergovernmental relations (Rhodes 1986), governmental actors, and interest groups' patterns of exchange (John 2001) led to the idea that both the agenda and the outcome policies were outlined by the networks. The policy networks originate from the increasing complexity of social problems, the actors' diversity, and conflicts of interest (Fleury 2002).

Networks consist of nodes interconnecting systems (Castells et al. 2000); they are collective constructions that enable interventions in social reality through participatory management (Junqueira 2004).

The distinction between the three basic types of network topology ("centralized, decentralized, and distributed") was developed in 1964 by Paul Baran, who outlined "horizontality; dialogicity and redundancy; and equity among nodes" as the main characteristics of distributed networks, which are reflected in collaborative digital networks called Web 2.0 and serve as guides for studies on networks of interrelationships between society and technological systems.

A sociotechnical perspective reveals the centrality of information and digital networks in the processes of socioeconomic transformation (Castells et al. 2000). Referring to the concept of a "network society" structured on digital communication networks, Castells et al. (2000) devised the term "network-state."



A) Centralized, B) decentralized, and C) distributed
Figure 1: The three basic types of network topology
Source: Baran (1964)

An offshoot of the network approaches is the work of Bruno Latour, John Law, and Michel Callon, which gave rise to the actor-network theory (ANT). ANT is based on the idea of a network of connections between human and non-human hybrid actors interacting heterogeneously through complex alliances that include the transformation of the actors themselves through the interaction process. The power arrangements established through the sociopolitical interactions influence one's self-definition of the actors and their roles in a democratic context of associations between entities. Furthermore, it integrates the very existence of the elements' "objects and their relationships, interfaces, and environments" that compose it (Law 1987).

Web 2.0

The term "Web 2.0" dates back to 2004 and was coined by Dale Dougherty, then vice-president of O'Reilly Media, Inc. (Andersen 2007). Web 2.0 is also known as "the wisdom Web, people-centric Web, participative Web, and read/write Web" (Murugesan 2007), which refers to further exploitation of the Web through a more interactive and collaborative dynamic.

The authors Chang and Kannan (2008) define Web 2.0 as "a networked world that supports individual users creating content individually and collectively, sharing and updating information and knowledge through sophisticated, diverse sharing devices and tools, and remixing and improving content created by each other" (p. 10). The concept of Web 2.0 is associated with the ideas of social software, social computing, participative web, user-generated content platforms, and the architecture of participation (O'Reilly 2007; Andersen 2007).

The intrinsic characteristics of Web 2.0 outline new trends in government-citizen interactions, establishing "social collaboration" horizontal arrangements (Benkler 2006) and the conception of new institutional designs based on practices of sharing decision-making power (Nam 2012). Sharing decision-making power, in turn, implies the recognition of the "collective intelligence," the enhancement of knowledge management tools, and the consequent enhancement of sociopolitical interaction channels.

The inherent values of Web 2.0 are "citizen-created content," "free flow of information," and "freedom of expression" (Bonson et al. 2012), which are based on collaborative and sharing dynamics that feed expectations among social actors concerning the modernization of government interfaces and public values production processes. In this way, it is possible to read about how non-human actors influence the behavior of human actors and alter the sociopolitical interaction network's nature (Arunachalam and Sarkar 2013).

Government 2.0

Government 2.0 is characterized by the use of "technologies, applications, and values" of Web 2.0 (Osimo 2008) and consists of the adoption of Web 2.0 by governments through practices and public administration data socialization processes (Johannessen 2010). This implies the adoption of pluralistic forms of government called "governance networks" (Tapscott et al. 2007).

The tendency toward citizen-centered government is due to technological influences, especially the Web 2.0 technologies (Eggers 2007). Initiatives related to Web 2.0, such as citizen-sourcing, are generally being consolidated in the public sector and are a priority for President Obama's administration (Schellong 2009).

Although a large number of agencies are implementing practices of citizen-sourcing (Bronk and Smith 2010), there has been a gap between reality and the visions of the potential of Government 2.0. Meijer et al. (2010) also perceive a gap between the innovative potential of 2.0 ideas and the operational reality of government organizations. According to these authors, this gap is due to a lack of alignment between organizational strategies and the values inherent to collaborative technologies (Meijer et al. 2010). Promoting this alignment implies the creation of an environment for collaborative culture within government agencies (Chang and Kannan 2008) as an important condition for achieving Government 2.0.

Citizen-government interactions

Studies dealing with the relationship between citizens and government have always been present in the research and practice of public administration (King et al. 1998; Denhardt and Denhardt 2011). The growing trend of governments' approaches to the citizen-centered model (Citizen-Centric-Government), which refers to the conduction of priorities and services based on the needs of society, induces governments to rethink and reshape their political interactions with citizens (Arunachalam and Sarkar 2013). The idea of active participation in "proposing policy options and shaping the policy dialogue" was addressed in Defining Government-Citizen Relations in Policy-Making OECD (2001).

Proposal of the SDIM theoretical scheme – Adaptation and reframing

In order to conduct this study, the concept of **sociopolitical digital interactions** was elaborated**,** which here is understood as the bottom-up and top-down dynamics of a government-citizen democratic relationship instrumentalized by the information and communication technologies (ICTs). The concept of maturity in reference to the sociopolitical digital interactions refers to the complexity level of the relationship between government and society. While disseminating information refers to publicizing and discussion implies articulating correct and strategic answers, co-creation demands more complex institutional, legal, and technological structures of power sharing and government responsiveness (for example, the establishment of e-petitioning policies).

The following three main ideas were used to articulate the concept of SDIM: the levels of interaction that lead to the maturity idea; the dynamic's flows of interaction; and the associations between levels/dynamics and Digital Interactive Tools. These three dimensions of the SDIM framework construction were developed considering four conceptual schemes.

The **maturity levels** of sociopolitical digital interactions were conceived from the combination of Vedel's democratic process sequences classification (information, discussion, and decision); the three strategic thrusts that structure the vision of a *Collaborative Government* according to the Singaporean Government's eGov2015 Masterplan of the Singapore Government (2013) (which are Co-creating for Greater Value; Connecting for Active Participation; and Catalysing Whole-of-Government Transformation); and government-citizen relations in policy-making discussed by the Organisation for Economic Co-operation and Development (OECD, 2001) (information, consultation, and active participation). By combining these categorizations, it was established that information corresponds to the basic level of interaction; *discussion* was related with *connecting* and determined the connection level; and *decision* was associated with *consultation, co-creating*, and *active participation*, and thus the third level of co-creation was established.

The idea of the **dynamic's flows** was developed from the categorization of government-citizen relations in policy-making discussed by the Organisation for Economic Co-operation and Development (OECD, 2001), which stated that information consists of a one-way relation, consultation (two-way relation), and active participation (a relation based on partnership). The classification of the government-citizen interaction dynamics observed in the theoretical scheme of SDIM was based on the sense of informational flows. These were classified into the following: (1) unilateral (government to citizen); (2) bilateral (between government and citizens, and one individual to many); and (3) multilateral (between government and citizens, one individual to many, and many individuals to one) (see Figure 2).

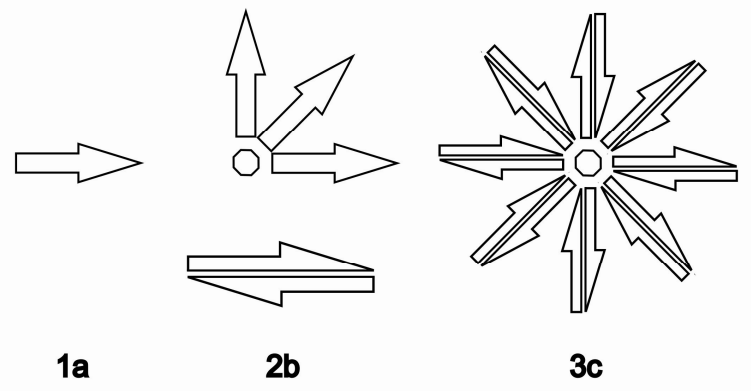


Figure 2: Directions of informational flows

The establishment of **associations between levels/dynamics and digital interactive tools** was inspired by the ideas about the correlations between Web 2.0 applications in government websites and information work provided by Chua et al. (2012). The authors identified four levels of information work (acquisition, dissemination, organization, and sharing) that were reshaped in the conception of sociopolitical interactions as dissemination, discussion and sharing, and consultation and collaboration.

These schemes structured relevant aspects of virtual interfaces, guidelines for e-government, and sociopolitical interactions, from which a theoretical scheme of SDIM was formulated that combined maturity levels, dynamics flows, and digital tools of government-citizen interaction (See Table 1).

Categories	Sociopolical Interactions	Description	Digital Interactive Tools
1 **INFORMATION**	Dissemination	Production and Distribution Unilateral Flow	blogs; microblogs; RSS feed; newsletter; downloading information availability; search engine
2 **CONNECTION**	Discussion and Sharing	Communicative Exchanges Bilateral Flow	social networks; professional networks; chat; contact forms / e-mail; multimedia sharing services; comment box
3 **CO-CREATION**	Consultation and Collaboration	Participative Construction and Collective Intelligence Multilateral Flow	e-vote; e-petitions; opinion polls; challenges; wikis; discussion forums; applications; open channel for suggestions; open data

Table 1: Theoretical framework of Sociopolitical Digital Interactions' Maturity (SDIM)

From this categorization, associations between sociopolitical interaction and digital tools were established. This categorization represents a way to analyze and possibly design formal and informal arrangements of democratic participation, mediated by electronic tools and virtual structures, which can facilitate collaborative processes between government and society.

Research Methodology

To conduct this study, a qualitative methodological approach was adopted. The content analysis of the 27 Brazilian states' government websites was structured on a theoretical scheme (SDIM), which allowed the verification and classification of digital interactive tools used in e-government portals.

The research was conducted in the steps described below.

i. Definition of the research universe

The research universe was defined as the 27 states of Brazil. The study proceeded to diagnose the current stage of development of sociopolitical interactions mediated by digital tools observed in the institutional websites of each of the federation's member states.

ii. Verification of sociopolitical interaction digital tools on government websites

In part, the methodological procedures used by Chua et al. (2012) were replicated in terms of the approach to verifying digital tools on government websites. The content analysis of the 27 Brazilian states' government websites was performed and recorded from December 18–21, 2013. The presence or absence of 21 electronic tools of sociopolitical interactions (blogs, microblogs, RSS feed, newsletter, downloading information availability, search engine, social networks, professional networks, chat, contact forms / e-mail, multimedia sharing services, comment box, e-vote, e-petitions, opinion polls, challenges, wikis, discussion forums, applications, open channel for suggestions, open data) was checked and the identified tools were classified according to a verification table (see Table 2) adapted from Mossberger et al. (2013). From the fulfillment of one table for each governmental website and according to the scoring criteria, the SDIM Ranking was established. The quantities of digital interactive tools are arranged by category in Table 4.

1 - INFORMATION	Y/N	2 - CONNECTION	Y/N	3 - CO-CREATION	Y/N
blogs		social networks		e-vote	
microblogs		professional networks		e-petitions	
RSS feed		chat		opinion polls	
newsletter		contact forms / e-mail		challenges	
downloading information availability		multimedia sharing services		wikis	
search engine		comment box		discussion forums	
				applications	
				open channel for suggestions	
				open data	

Table 2: Roadmap for digital interactive tools verification
Source: Adapted from Mossberger and Wu et al. (2013)

iii. Scoring criteria

The categories shown in Table 2 were assigned numeric values depending on the sociopolitical interaction dynamics' complexity levels. Thus, every digital tool pertaining to information production and distribution activities (Level 1) is assigned the value of a point in the units place; every digital instrument relating to communicative exchanges (Level 2) is assigned the value of a point in the tens; and every electronic tool regarding the participatory construction (Level 3) is assigned the value of a point in the hundreds.

The example of the state of São Paulo is cited to illustrate the process of a government website's ranking; the observation of governmental open data (level 3 tool) gives a point in the hundreds; the verification of social networks, contact forms/e-mail, multimedia sharing services, and comment box (that consist of four level 2 tools and confer four points in the tens, adding forty points); and the presence of microblogs, RSS feed, newsletter, downloading information availability, and search engine (five level 1 tools, gives five points in the units place, adding five points), for a total of 145 points (See Table 3).

The Brazilian government's electronic portals ranking was established from the government-citizen's interface digital tools verification and its related numeric value (based on the scoring criteria). Hereafter, the analyses and considerations were seted.

Findings

The concept of collaborative platforms applied to the governmental context refers to the growing challenges (technical, political, and ideological) faced by governments regarding the promotion of citizen

co-production of knowledge, information (Misuraca 2009; Johannessen 2010; and Nam 2012), services, and public policies.

Sharing information and promoting political discussions can lead to citizens' empowerment; however, the co-creative practices of social participation promotion in the public policies cycle (formulation, implementation, and evaluation), the extraction of knowledge and its use in collective intelligence formatting consists of the most advanced levels of digital sociopolitical interaction. Acting on these levels implies the government's democratic and technical maturity as well as the promotion of an alignment between "Web 2.0 operating strategies and strategic organizational guidelines" (Meijer et al. 2010).

This study represents a specific point in the analysis of interactive tools between society and the "State in motion" (Dias 2011), classifying the nature of government-citizen relations. Modes of democratic participation, mediated by digital tools, configure interactive processes of communication and collaboration between government and society, and insert new codes in the "Network State" software, which can result in governmental innovations (Bloch and Bugge 2013).

The Brazilian federation's states' government websites were ranked according to the scoring criteria established in the methodological procedures section.

Ranking	State	SDIM	Tools Quantities	Ranking	State	SDIM	Tools Quantities
1 º	Rio Grande do Sul	4.4.4	12		Paraná	3.4	7
2 º	São Paulo	1.4.5	10		Goiás	3.4	7
3 º	Pernambuco	1.3.5	9		Amazonas	3.4	7
4 º	Maranhão	1.3.4	8	10 º	Santa Catarina	3.3	6
5 º	Espírito Santo	1.3.3	7		Amapá	3.3	6
	Roraima	1.3.3	7		Paraíba	3.3	6
6 º	Rio de Janeiro	1.2.4	7	11 º	Mato Grosso do Sul	2.3	5
7 º	Ceará	1.1.4	6		Acre	2.3	5
8 º	Minas Gerais	3.5	8	12 º	Pará	2.2	4
	Mato Grosso	3.5	8	13 º	Rondônia	2.1	3
	Rio Grande do	3.5	8	14 º	Tocantins	1.3	4
	Piauí	3.5	8		Sergipe	1.3	4
9 º	Distrito Federal	3.4	7	15 º	Bahia	1.1	2
				16 º	Alagoas	2	2

Table 3 – Ranking the 27 Brazilian Federation's states' government websites

It was observed that the government websites of Rio Grande do Sul, São Paulo, and Pernambuco had the highest number of interactive tools (12, 10, and 9, respectively). In contrast, the electronic portals of Alagoas, Bahia, Sergipe, and Tocantins had the smallest number of government-citizen interactive tools (2, 2, and 4, respectively).

In Table 3, sociopolitical interaction electronic tools on government websites were checked and organized. The study identified the most widely adopted mechanisms and digital tools: the availability of downloading information (26/27 = 96.3%), followed by search and contact forms/email (25/27 = 92.6%), microblogging (Twitter) (21/27 = 77.8%), social networking tools (Facebook) (20/27 = 74.1%), multimedia sharing (YouTube) (18/27 = 66.7%), and RSS feed (14/27 = 51.8%).

The following tools were detected less: e-voting, wiki, suggestions, and chat (1/27 = 3.7%); comment boxes (2/27 = 7.4%); blogs (3/27 = 11, 1%); and opinion polls and open data (4/27 = 14.8%).

The tools that were not detected on the state governments' websites included the following: e-petitions, challenges, permanent discussion forums, applications, and professional networks (LinkedIn).

INFORMATION							CONNECTION							CO-CREATION										
blogs	microblogs	RSS feed	newsletter	downloading information availability	search engine	Subtotal	social networks	professional networks	chat	contact forms / e-mail	multimedia sharing services	comment box	Subtotal	e-vote	e-petitions	opinion polls	challenges	wikis	discussion forums	applications	open channel for suggestions	open data	Subtotal
3	21	14	6	26	25	**95**	20		1	25	18	2	**66**	1		4		1			1	4	**11**

Table 4: Digital interactive tools quantities by category
Source: Adapted from Chua and Goh et al. (2012)

Rankings of the Brazilian states' SDIM levels were based on the number of electronic tools observed at each interactive level; thus, websites such as Minas Gerais' (35), which counted five tools at level 1 (microblogs, RSS feed, newsletter, downloading information availability, and search engine), three tools at level 2 (social networks, contact forms/e-mail, and multimedia sharing services), a total of eight tools, were rated below portals like Ceará's (114), which had four tools at level 1 (microblogs, RSS feed, downloading information availability, and search engine), one tool at level 2 (contact forms/e-mail), and one tool at level 3 (open channel for suggestions), a total of six tools.

It may be observed that the scoring criteria greatly value the level 3 tools (hundreds), which characterize democratic co-creation modalities that empower citizens to collaborate in the policy-making cycle (OECD 2001) in detriment of Level 1 tools (units) of information dissemination; the developed criteria may be considered as a qualitative criteria to the detriment of the quantitative criteria of simple tools counting. An example is the previously mentioned comparison between the Minas Gerais government website that counted eight tools and was classified below the Ceará government website that totaled six tools because of the categorization of the perceived tools. This approach determines the distinction between high and low website rankings.

From the 172 government-citizen interaction tools detected, 95 (55.2%) were level 1, 66 (38.4%) were level 2, and 11 (6, 4%) were level 3. This indicates a predominance of levels 1 and 2 interaction tools on governmental websites, and a tendency not to promote level 3 interactions.

It was observed that the use of level 3 tools is very limited in the Brazilian government. Nonetheless, there is a growing global trend toward citizen-centered governmental practices, caused in part by rising citizen expectations of public governance and government-society partnerships (Chua et al. 2012). In the context of Brazil, there is a noticeable timidity in the practice of interactive instrumentation at level 3. Perhaps this is because of the country's patrimonial and bureaucratic historical legacy, which has been characterized by governmental closure to social participation initiatives in democratic processes.

The omission of certain tools on the governments' websites, such as electronic petitions (e-petitions), challenges, discussion forums, and permanent applications, denotes traces of political centralization. This centralization comes at the expense of practical power-sharing in decision-making processes and impedes governmental openness to a co-creative public policy model.

Also indicated by the study is the incipient capacity of Brazilian states to operationalize, from collaborative processes, the extraction of collective intelligence systems and identification of value trends that could be used for political strategy processes (Suh, Park, et al. 2010); **social sentiment analysis**

(Di Caro and Grella 2012); mining of opinions, data, and texts (Robaldo and Di Caro 2013); the production of applications that streamline service delivery and public information; and what Chalmers (2013) calls the "open social innovation" of processes management. The absence of permanent forums in electronic portals represents the unwillingness and inability to manage differing opinions and societal and opposition criticisms that may impact the political image of the government.

It is important to note the state of Rio Grande do Sul's initiative to modernize the practices of democratic participation in the national digital realm, highlighting the Portal of Participation (http://www.participa.rs.gov.br/) and the Digital Cabinet (http://gabinetedigital.rs.gov.br/), which are accessible through the state's government website. In contrast, the study noted the large deficit of sociopolitical interaction tools available through the state of Alagoas' government website.

Conclusion

The perception of a tangled dynamic between actors and networks, as well as between governments and citizens, leads to the essentiality of sociopolitical interaction approaches to the extent that an actor's behavior mutually stimulates conceptual reviews, actions, and reactions from the state.

The promotion of democratic institutional development from government-society interfaces is based on compliance factors inherent in the actor-network circuit, such as education, social participation, public governance, the material context (non-human), legal mechanisms, electronic tools, etc.; these are intrinsic to the public values production process. The digital interfaces consist of effects and processes of a continuous and reciprocal network transformation.

Given the great complexity involved in the "civil empowerment" process, the importance of open government data and open discussion channels between the society and the government is a fundamental requirement for promoting practical sociopolitical co-creation and collaboration. In this sense, the induction of social empowerment implies a revision of ideological positioning and the promotion of changes in the power structure, which culminates in the policy processes related to government innovations.

The proposed driving objective of this study was achieved by responding to the question of a possible way to classify the Sociopolitical Digital Interactions' Maturity levels, which consisted in the development of a conceptual framework (SDIM) that demonstrated theoretical usefulness when structuring a focused understanding for analysis and evaluation of government-citizen interactions electronic tools. SDIM is likely to be used as a guide for designing and improving government-society digital interactions tools on government websites. This will be done with the aim of increasing the e-democratic participation processes through which society informs, communicates, and collaborates with government, thereby positively influencing the state's actions (public policy).

Reiterating the gaps presented by Bonson et al. (2012) and Cegarra-Navarro et al. (2012), the study addressed issues related to the understanding of how new ICTs impact government-citizen relations and government actions through the digital environment. Analyses of the current stage of digital sociopolitical interactions development observed in governmental websites of Brazilian states showed that most of the electronic tools provided by state governments focus on level 1 (information) and have a tendency to shy away from the instrumentalization of interactions on level 3 (co-creation).

Based on this perception, the low technological complexity and democratic unwillingness of the analyzed governments regarding the instrumentalization of democratic participation processes, particularly in the collaborative dimension, was observed. There is an incipient capacity of Brazilian state governments to operationalize mechanisms of social empowerment, collective intelligence extraction, and identification of trends of values that can be used in processes of policy formulation strategy.

The Web 2.0 social values changed social expectations regarding government actions. Static websites and digital instrumental level 1 (unilateral flow) are only aligned with the most elementary part of any e-democratic participation policy promotion. The perception of the paucity of digital instrumental level 3 (multilateral flows) reinforces the current traces of highly concentrated political power and the late

development of a civic culture, which has culminated in timid practices of decision-making and sharing. It indicates a lack of government openness to a government-citizen co-creative and collaborative model.

This picture recalls legacies of a historical process characterized by colonial exploitation, neglect, and oppression of popular political participation initiatives, as well as a nation in which the social structure has been strongly marked by long-term slavery, a period of military repression, and patrimonial, centralized government. These characteristics have shaped a stance/behavior where grassroots movements engaged in democratic participation represented an affront to institutionalized power. Those who dared oppose the Portuguese crown (colonial phase) or the military government (military coup phase) were punished as an example to others. These political processes have consolidated a culture of misconsideration of grassroots democratic participation that still currently reflects the governmental unwillingness to implement public policies (such as e-petitioning) attuned with level 3 tools of sociopolitical collaboration that requires a political culture open to sharing decision-making power.

Characterized as a historically oligarchic state and thus locked out of the practices of public governance, democratic participation, and effective sociopolitical interaction, the e-Government Portal of Maranhão was ranked fourth in the general classification with respect to levels of SDIM for submitting an opinion poll. From the contextual observation of this case, it was established that it is not possible to infer the level of institutional democratic development of the state governments by checking the SDIM of a government's website.

If the example of Rio Grande do Sul is taken as a parameter for comparison between the other state government websites, it is noted that there is a long way to go with regard to electronic democracy development in the Brazilian states. In this way it is important to highlight the leadership of the state of Rio Grande do Sul concerning the adoption of level 3 sociopolitical digital interaction tools.

Regarding the limitations of this study, it must be stressed that the universe analyzed was a narrow one, restricted to the states of Brazil. It must also be mentioned that the analysis of government websites was undertaken by one person, which prevented the cross-referencing of reviews and limited the revision of the results of the analysis.

Future studies could expand the scope of analysis to other contexts and generate comparisons between sociopolitical, economic, and technological indicators between countries, regions, continents, etc.; this could help to verify possible hypotheses about the correlation between levels of SDIM and other categories of analysis. A specific methodological approach could also be adopted in order to validate SDIM as a theoretical model.

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APPENDIX

Although the availability of data can be classified as a one-way information flow and therefore as a level 1 tool, the fact that the data meets in an open format affords it a characteristic of level 3. Also, it consists of an invitation to collaborative forms of sociopolitical interaction that may culminate in applications, challenges, and wiki platforms of shared work between government and citizens. Therefore, the availability of Open Data has been classified as a digital instrument of level 3.