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Proposed governance model for the Federal District: connections between smart specialization and social technologies

Proposta de modelo de governança no Distrito Federal: aproximações entre especializações inteligentes e tecnologias sociais

Propuesta de modelo de gobernanza en el Distrito Federal: aproximaciones entre especialización inteligente y tecnologías sociales

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Abstract:
This study aims to present a governance proposal connecting the smart specialization model and social technologies in the context of the Federal District. Among the authors consulted to establish this study's conceptual framework, the following stood out in defining smart specialization: Foray, David and Hall (2011), Săftescu et al. (2016), Foray et al. (2012), Ratajczak (2014), Mccann and Ortega-Argilés (2011), and Rinaldi et al. (2018). For social technologies, the main authors were Adams (2011), Dagnino et al. (2004), Fernandes and Maciel (2011), Freitas, Kühl and Segatto (2013), and Gonçalves (2008). The study employed descriptive research, collecting data through bibliographic and documentary surveys, and adopted a deductive approach in which relationships were analyzed through a theoretical framework. The findings indicate that, despite differences in focus and development context, connections exist between smart specialization and social technologies. A collaborative governance model can therefore be implemented as a public policy coordinating stakeholders and contributing to the reapplication, improvement, adaptation and development of social technologies.

Keywords:
Smart specialization. Social technologies. Governance. Science, technology and innovation policy.

Resumo:
Este estudo tem como objetivo apresentar uma proposta de governança a partir da aproximação do modelo de especializações inteligentes e das tecnologias sociais no contexto do Distrito Federal. Dentre os autores pesquisados para a constituição conceitual deste trabalho, destacaram-se, na conceituação de especializações inteligentes: Foray, David e Hall (2011), Săftescu, et al. (2016), Foray, et al. (2012), Ratajczak (2014) Mccann e Ortega-Argilés (2011), Rinaldi, et al. (2018). Na conceituação de Tecnologias Sociais: Adams (2011), Dagnino, et al. (2004), Fernandes e Maciel (2011), Freitas, Kühl e Segatto (2013) e Gonçalves (2008). O método utilizado foi a pesquisa descritiva, tendo como coleta de dados o levantamento bibliográfico e documental, a abordagem foi o dedutivo onde as relações foram analisadas a partir de um arcabouço teórico. Como conclusões foi possível diagnosticar que, apesar das diferenças do foco e do local de seu desenvolvimento, há aproximações entre especializações inteligentes e tecnologias sociais, sendo possível a implementação de um modelo de governança colaborativo como política pública articuladora dos atores e contribuir para a reaplicação, aprimoramento, adaptação e desenvolvimento das tecnologias sociais.

Palavras-chave:
Especializações Inteligentes. Tecnologias Sociais. Governança. Política de Ciência Tecnologia e Inovação.

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Resumen:
Este estudio tiene como objetivo presentar una propuesta de gobernanza a partir de la aproximación entre el modelo de especialización inteligente y las tecnologías sociales en el contexto del Distrito Federal. Entre los autores investigados para la constitución conceptual de este trabajo, destacaron, en la conceptualización de especialización inteligente: Foray, David y Hall (2011), Săftescu et al. (2016), Foray et al. (2012), Ratajczak (2014), Mccann y Ortega-Argilés (2011) y Rinaldi et al. (2018). En la conceptualización de tecnologías sociales: Adams (2011), Dagnino et al. (2004), Fernandes y Maciel (2011), Freitas, Kühl y Segatto (2013) y Gonçalves (2008). Se utilizó la investigación descriptiva, con recopilación de datos mediante revisión bibliográfica y documental y un enfoque deductivo en el que se analizaron las relaciones a partir de un marco teórico. Como conclusión, se diagnosticó que, pese a las diferencias de enfoque y del lugar de desarrollo, existen aproximaciones entre especialización inteligente y tecnologías sociales, siendo posible implementar un modelo de gobernanza colaborativa como política pública articuladora de los actores y contribuir a la reaplicación, mejora, adaptación y desarrollo de las tecnologías sociales.

Palabras clave:
Especialización inteligente. Tecnologías sociales. Gobernanza. Política de ciencia, tecnología e innovación.

1. Introduction

The Brazilian state adopts certain initiatives to encourage the country's technological development; examples include Law No. 10,973/04 (Innovation Law) and, subsequently, Law No. 11,196/05 (Lei do Bem). These initiatives reach medium-sized and large companies, generally through tax incentives. Even for these companies, incentive measures and their results lack coordination, oversight and evaluation. Consequently, the most vulnerable segment of the national productive sector, social entrepreneurs, receives no support for development and improvement, even when developing social technologies (ST).

Beyond this partial coverage of the productive sector receiving “support,” tax incentives linked to technological development do not constitute a structured public policy divided into cycles whose results can be evaluated. This is particularly because these measures rely solely on legislation, without effective participation by the state or other stakeholders interested in technological development.

In an attempt to coordinate and implement existing legislation, a National Technology Policy was established in early 2018 through Decree No. 9,283 of February 7, 2018. According to its legal text, its purpose was to “establish measures encouraging innovation and scientific and technological research in the productive environment, with a view to technological capacity building, achieving technological autonomy and developing national and regional productive systems” (BRASIL, 2018).

The Innovation Law was amended in 2016 to include the guideline: “VI - promote the development and dissemination of social technologies and strengthen technological extension for productive and social inclusion” (BRASIL, 2004). Despite this new guideline, its 2018 implementing regulations made no mention of social technologies or measures for productive and social inclusion. This omission reflects the state's ongoing neglect of ST.

However, the National Social Technology Policy proposed through Senate Bill (PLS) 3,329/15, authored by then-Senator Rodrigo Rollemberg, was approved by the Chamber of Deputies on August 16, 2017, when it underwent amendments. As a result of these amendments, it awaits further consideration by the Federal Senate before presidential approval. If enacted, the law will have only seven articles, but will represent equal treatment, at least in regulatory terms, for traditional and social technologies (BRASIL, 2015).

Establishing a National Social Technology Policy, as proposed in PLS 3,329/2015, is an advance because it provides legal definitions of social technology and innovation in social technology. It also defines the policy's principles and objectives, the instruments of the National Social Technology Policy, and the inclusion of ST in eleven existing public policies and national projects of interest to ST. One of its most important advances is mandatory equal treatment with science, technology and innovation: “Social technology activities shall receive treatment identical to that afforded to other activities undertaken in the science, technology and innovation sector” (BRASIL, 2015).

Social technologies offer possibilities for economic, social, inclusive and sustainable development, with the potential to reach part of Brazil's population excluded from conventional productive processes. However, they currently occupy only a few niches restricted to associations, social organizations and communities. This results from limited dissemination potential caused by the lack of coordinated incentives, credit lines and financing arrangements (DAGNINO, 2004; FÉLIX et al., 2009).

The products derived from ST should not be understood as the same products derived from smart specialization (SS). The latter is based on an academic conception combined with the structuring and implementation of public policies. The European Union promoted the development and improvement of smart specialization. The model is now implemented and undergoing continuous development in numerous European regions and Latin American countries. In Brazil, an experience has been implemented, evaluated and reported in Pernambuco, another has been implemented and is developing in Goiânia, and an academic proposal exists for Manaus (EUROPEAN COMMISSION, 2014a).

Connections between ST and SS include a shared interest in local, territorial and human development based on applying knowledge and developing solutions, as well as innovation and the promotion of sustainable, inclusive solutions with social repercussions. SS consists of institutionalized initiatives in Europe, whereas ST in Brazil receives modest state support and exists primarily through the efforts of social organizations, associations, communities and individuals who must be considered when institutionalizing the model.

Studying models conceived and implemented in Europe, alongside Brazilian experiences using smart specialization, showed that governance arrangements can contribute to the development of social technologies in Brazil. This finding stems from observing similar principles and values in the forms of territorial engagement associated with both models.

2. Theoretical framework

2.1 The European smart specialization model

Smart specializations (S2) are development strategies created and disseminated with European Union support. In regional public policy practice and academic research, “smart specializations” was a new term. Its coinage served a specific purpose within the European context: overcoming the economic crisis of the 2000s and preparing regions and countries for technological development (EUROPEAN COMMISSION, 2014a).

SS also does not accommodate initiatives formulated solely at the national level: local involvement is necessary, and each locality develops specializations suited to its strengths. Thus, regions focused on international exports or agriculture, for example, may differ significantly in their vocations. Different regions face their own challenges and possess unique capabilities that a smart specialization strategy must consider (MIDTKANDAL; SORVIK, 2012).

Smart specialization strategies are characterized by their application in a particular region and by the possibility of empirically testing their effectiveness in achieving their aims (CARAYANNIS; GRIGOROUDIS, 2016). These authors also maintain that SS can be applied outside Europe. This claim is supported by initiatives in Latin American countries: Mexico, Colombia, Peru, Chile and Argentina. In Brazil, the most advanced projects can be observed in Recife, Pernambuco, and Goiânia, Goiás (BARROETA et al., 2017).

Given the academic origin of “smart specializations,” we sought bibliometric information to guide the theoretical framework. A search for the English term “smart specializations” in Web of Science returned nine works published between 2014 and 2018. In

the same database, “smart innovation strategies,” which can be translated into Portuguese as strategies for smart innovations, returned no results for any period. Finally, “smart specializations strategies,” translated as smart specialization strategies, returned eighteen articles in Web of Science. None of the search results showed a substantial number of citations (WEB OF SCIENCE, 2018).

Continuing the bibliometric searches in the broader Google Scholar database using the same terms produced the following results: (1) “smart specializations” returned four hundred and sixteen articles totaling six hundred and forty-nine citations. No work had more than forty citations; works with up to five citations predominated, and articles were published from 2011 to 2018. (2) “smart innovation strategies” returned four articles and forty citations for 2008 to 2018. (3) “smart specializations strategies” returned twenty-four articles and twelve citations for 2012 to 2018 (GOOGLE ACADÊMICO, 2018).

No work related to smart specialization was found in the thesis and dissertation database of the Coordination for the Improvement of Higher Education Personnel (CAPES). Searching Google Scholar for the Portuguese expression “especializações inteligentes” returned only the final report of the experience implemented in Pernambuco and reported in January 2018.

The seminal work on smart specialization was Smart Specialisation: the concept (FORAY; DAVID; HALL, 2009), published in Knowledge for Growth: Prospects for science, technology and innovation, a European Commission initiative launched in March 2005 whose results were published in 2009.

The project of which this work formed part brought together experts to develop advice and ideas to help Europe overcome the economic crisis of the first decade of the twenty-first century and prepare for approaching technological developments. The SS concept was presented in one of eleven articles separately addressing topics selected for the European Union's regional economic development (EUROPEAN COMMISSION, 2014a).

Overcoming economic and social difficulties was a challenge experienced in Europe after the economic crises of the first decade of the 2000s. Smart specialization was a strategy to address development across several European regions (CARAYANNIS; GRIGOROUDIS, 2016). SS faced the challenge of “strengthening regions and developing specific sectors of economic activity through the introduction of innovations” (FORAY, 2017).

The European Commission, “the executive body that upholds the general interests of the European Union,” maintains a website entitled Strategies for Smart Specialisation Platform, represented by the acronym S3P, which can be freely translated into Portuguese as a platform for smart specialization strategies. This platform constitutes a research source precisely because

its objective is to disseminate initiatives, particularly within the European Community (EUROPEAN COMMISSION, 2014a).

The system relies on public policy instruments aimed at internationalization, entrepreneurship and incubation, connecting universities, and social innovation. Its priorities include support for small and medium-sized enterprises, social innovation, financial engineering, enabling technologies, research infrastructure, cultural and creative industries, and green growth (MIDTKANDAL; SÖRVIK, 2012).

It promotes smart, sustainable growth through a revolutionary economy that considers geographical, cultural and environmental potential (MIDTKANDAL; SÖRVIK, 2012). Economic growth follows from encouraging innovation and development in any economic field, such as fishing or tourism. Smart specialization is therefore not restricted to traditional technological fields; this development proceeds through stages (FORAY; DAVID; HALL, 2009).

The development stages are analysis of regional context and potential, formation of a governance system, construction of a vision for the future, establishment of priorities, a policy mix, and monitoring and evaluation (MIDTKANDAL; SÖRVIK, 2012). From the perspective of these stages and a multidirectional approach, the actors involved, namely government and companies, undertake the following activities:

identify entrepreneurial discoveries;

support and possibly channel these initiatives in particular directions through a variety of incentive mechanisms, including conditional subsidies;

monitor and evaluate, in interaction with private-sector stakeholders and independent parties, the progress of “experiments,” and thereby;

disseminate and guide the formation of a shared strategic vision of the future course for exploring the region's emerging specialization opportunities;

identify and address potential coordination failures, so that some discoveries are likely to become real, robust pilot models for regional economic growth;

monitor and reassess the extent to which the shared strategic vision is being realized, the effectiveness of measures addressing coordination failures, the impacts on the region's economy and the sustainability of development without continued public support (FORAY; DAVID; HALL, 2009, p. 11).

In Brazil, social technologies are an academic construct with supporters, organizations and individuals, mostly without state ties. Examples include associations, foundations, nongovernmental organizations and, most prominently, the Banco do Brasil Foundation (FBB).

Their main role is to seek dissemination through reapplication and encourage the development of innovative new solutions classified as applicable ST.

ST is an academic construct with practical experiences within movements such as Solidarity Economy Networks (RESs), Technological Incubators for Popular Cooperatives (ITCPs), and nongovernmental organizations (NGOs). Understanding these characteristics, we considered research using other indicators of scientific production more productive than bibliographic searches in international journal repositories. These indicators include academic works (theses and dissertations) and books by Brazilian researchers, consulted to identify the seminal foundation of ST.

Thus, a Google Scholar search conducted on November 17, 2018, using the Portuguese term “tecnologias sociais” identified the seminal Brazilian text on social technologies: Renato Dagnino's master's dissertation “Tecnologia apropriada: uma alternativa?”, submitted to the graduate program in Economics of the Department of Economics at the University of Brasília in December 1977.

It is important to note that although this seminal work's title uses “appropriate technology” rather than “social technologies,” this does not invalidate the connection between the subjects, since the same author explains the relationship between the expressions in later works. Although social technologies and appropriate technology are related, these expressions are not synonymous. These later works were also located in the same search, particularly Dagnino (2004) and Brandão (2001).

3. Materials and methods

This exploratory research comprises a theoretical framework and documentary research seeking to understand and compare the concepts of smart specialization and social technologies in light of previous studies.

The methodological approach is qualitative because a qualitative approach presupposes analysis of the “phenomenon or establishment of relationships between variables” (SILVA; MENEZES, 2005, p. 21), in this case ST and SS.

The research is descriptive and based on perceived gaps. The gap observed here is the lack of studies supporting systematic actions enabling the reapplication, improvement, adaptation and development of ST, with the possibility of measuring and evaluating results.

Regarding procedures, the research is bibliographic, consulting books, articles, theses, dissertations and documents from the institution studied. Documentary and bibliometric research were also used to support the bibliographic research.

Documentary research drew on online databases and publicly accessible physical documents. These were used to understand governmental and third-sector actions concerning the implementation of incentive policies in the Federal District and at the federal level. Documentary research also helped characterize the Federal District region. The documentary survey constituted this study's analysis of primary sources.

Bibliometric research sought pioneering works on the main concepts studied, traced the evolution of scientific production on these subjects and identified the most recent works. In addition to measuring scientific production and its relevance through citations, bibliometric research provides a means of checking that another researcher has not already addressed this study's research problem (VANZ; STUMPF, 2010).

Technological tools are currently available to operationalize bibliometric research. The two tools used were Web of Science (WoS) and Google Scholar.

Web of Science® (WoS), produced by the Institute for Scientific Information (ISI) since the 1960s, provides access to three citation indexes: Science Citation Index Expanded, Social Sciences Citation Index, and Arts & Humanities Citation Index (THOMSON CORPORATION, 2004). It enables highly specific searches using several filters.

With a broader search base and more limited filtering capabilities, Google Scholar® enables searches for documents not indexed in renowned bibliographic databases, including books, theses, dissertations, abstracts, articles and preprints from academic publishers, professional organizations, universities and other institutions (GOOGLE, 2010).

This work adopts a deductive approach, analyzing particular cases in light of previously developed concepts to address the research findings epistemologically. We prioritize European and Brazilian smart specialization experiences and present a governance proposal to improve social technologies in Brazil.

4. Results and discussion

This study does not propose applying SS as originally conceived in Europe or as reapplied in other Brazilian contexts (Recife and Goiânia). Its objective is to present a governance proposal connecting the smart specialization model and social technologies within the Federal District context.

Similarities and connections between smart specialization and social technologies. Both SS and ST promote technological innovation. SS employs research and development (R&D) in traditional technologies to achieve economic transformation within a region or country. Social technologies, in turn, provide a means of social transformation for communities or regions, promoting social innovation and offering potential for job and income creation.

Neither case concerns state industrial policies or forms of industrial development. Smart specialization rejects a sharp division of labor between knowledge producers and knowledge users. These approaches are multidisciplinary and can be developed and applied in any sector, a characteristic shared by ST (FORAY; DAVID; HALL, 2009; DAGNINO, 2004).

Both are knowledge-based tools for overcoming difficulties, focus on collective interests and offer knowledge open to use, adaptation and improvement by anyone interested. In social technologies, technological products are open; in smart specialization, the coordination and management methodology is open, while SS products are protected (FORAY; DAVID; HALL, 2009; ITSBRASIL, 2004).

Open data can be found on digital platforms and in documents. For SS, the platform is linked to the European Union: the S3 platform, available at http://s3platform.jrc.ec.europa.eu/s3-platform. ST has no single platform, precisely because it lacks a specific public policy, causing a loss of synergy in utilizing the technologies developed.

The lack of studies on better ways of utilizing ST constitutes the gap motivating this study. Nevertheless, initiatives by civil society organizations can be found, including the Banco do Brasil Foundation, particularly through its Social Technologies Database (BTS), the Social Technology Institute, the Social Technology Network and the Kairós Institute. Regarding governmental initiatives, there is only a conceptual reference on the website of the Ministry of Science, Technology, Innovation and Communications.

This absence of state participation in ST generates spontaneity in creating and developing solutions, also observed in SS. Both fit the characteristics of learning processes led by entrepreneurial actors with participation from society and universities and an academic focus (FORAY; DAVID; HALL, 2009; DAGNINO, 2004).

Beyond their focus or interest, academic development in SS and ST can be observed through university participation. Both exclusively encompass sustainable initiatives developed by the private sector, focusing on social innovation. They are based on regional, geographical or cultural potential and on solving local social or environmental problems. ST is related to the smart economy and can be encouraged through participation by social sectors,

social organizations and universities (FORAY; DAVID; HALL, 2009; DOROTEU; CARVALHO; SANTOS, 2018).

Beyond development possibilities, ST represents “a pedagogical process for everyone involved; dialogue between different forms of knowledge; educational dissemination and action; participatory planning, monitoring and evaluation processes; and citizen-based construction of the democratic process” (SEIXAS et al., 2015, p. 2,680). SS, meanwhile, is related to R&D and innovation and suggests that a region specialize in innovation and R&D linked to a sector suited to its economic, social, natural or cultural characteristics, “for activities such as tourism or fishing” (FORAY; DAVID; HALL, 2011). Both examples reveal capacities for learning, discovery and innovation.

Given the complexity of each region's characteristics and the groups to be involved, implementing a public policy or project cannot involve telling people what to do. This applies to ST and SS alike. What can be organized is the monitoring of emerging trends, improved coordination, provision of necessary public goods (education and training), and additional incentives at critical bottlenecks to help new activities develop (FORAY; DAVID; HALL, 2011; DOROTEU; CARVALHO; SANTOS, 2018).

Both SS and ST can be seen to focus on people rather than markets. Possible economic benefits arise as consequences. Both face the dilemma of market innovation versus social innovation. In this context, both offer opportunities for government, which is responsible for encouraging science, technology and innovation (ST&I) policy, to fulfill this role in new niches (FORAY; DAVID; HALL, 2011; DOROTEU; CARVALHO; SANTOS, 2018).

While the European Union seeks to encourage public policies supporting SS as social innovation through the formation of a critical mass to develop economic, social and environmental solutions (EUROPEAN COMMISSION, 2014b), Brazil possesses a potentially valuable tool. This Brazilian tool, ST, enables the combination of information and knowledge to transform reality by developing “reapplicable products, techniques or methodologies” (ITSBRASIL, 2004).

For Brazil to systematize the use of this tool, lessons must be learned from the European Union and considered when adapting the model to Brazilian reality. The main lesson can be understood as institutionalizing an interactive governmental public policy encouraging ST development and reapplication. This policy should be horizontal, following neither an essentially top-down nor an essentially bottom-up logic. This horizontal, bidirectional experience relates to the principle of entrepreneurial discovery essential to the model. The policy's horizontal character does not diminish the importance of governance group

interventions at necessary stages, such as identifying, evaluating and providing targeted support for new proposals (FORAY; DAVID; HALL, 2011, p. 15).

The policy's objective is neither to create state intervention in innovation initiatives nor to benefit a particular sector or group: “certainly the main issue to be addressed by policy is not ‘what to do,’ but ‘how to help agents discover what to do and how to implement policy according to what has been discovered’” (FORAY; DAVID; HALL, 2011, p. 15).

A governance model must be developed alongside the policy. A particular aspect of designing excellence-oriented governance mechanisms and structures concerns the need to develop a stronger innovation ecosystem (MARIUSSEN et al., 2016, p. 248). The governance model must be democratically constructed among the parties involved. Even in Europe, several models are being tested in different countries and/or regions (SĂFTESCU et al., 2016).

Based on European experience, governance model construction should consider the following: involve all stakeholders; support all forms of social innovation and social technology; encourage experimentation and investment in social initiatives; analyze contexts and regional potential; establish a vision for the future; select priorities; create an incentive portfolio; monitor and evaluate; pursue policy efficiency and effectiveness; avoid overlapping initiatives in the same context; and prevent capture by interest groups (SÖRVIK, 2012; SĂFTESCU et al., 2016).

Adapting Sörvik's (2012) recommendations for SS governance, the objectives of ST governance should include development and reapplication of social technologies, social entrepreneurship and incubation; connecting universities; promoting social innovation; involving social groups; supporting cultural and creative initiatives; generating economic activity and income; alternative energy sources; and green growth.

The RIS3 guide, published on the European Union's S3 platform, recommends establishing a governance model to put SS into practice and unite stakeholders. Its role is to support and design collaboration between the parties involved and the strategies (EDWARDS; PERTOLDI; MORGAN, 2016).

Once several actors are involved in a collaborative process, decisions must be made. The governance model serves to “describe how the entire process of designing and implementing S3 is governed, including who is involved, the structures put in place and how decisions are made” (EDWARDS; PERTOLDI; MORGAN, 2016, p. 37).

In practice, governance becomes essential because “effective strategies are not implemented exclusively by national or regional authorities. Executive power is shared with innovation actors, networks and, indeed, civil society more broadly.” Thus, this involves more

than creating a collaborative network: networks, social organizations and all other actors are involved and legitimized within a process where decision-making control is democratic (EDWARDS; PERTOLDI; MORGAN, 2016, p. 37).

Government participation is indispensable only in aspects involving exclusive state responsibilities, such as regulating certain activities or releasing public resources (EDWARDS; PERTOLDI; MORGAN, 2016). In the model to be adapted to the social technologies context, seven principles should be considered:

Leadership and participation to enable innovation;

Cohesion to implement a collective vision;

Independence and transparency;

Integrated implementation;

Incorporating smart specialization into regional policymaking;

Beyond the principles applicable to SS and adaptable to ST, the governance model also has keys to success. We explain these below and suggest how they can be contextualized to ST in Brazil; both appear in Chapter II of the manual prepared by Edwards, Pertoldi and Morgan (2016).

The first key is the “selection of programs and projects to be supported” (EDWARDS; PERTOLDI; MORGAN, 2016, p. 37). Although ST currently appears in the National Science, Technology and Innovation Strategy 2016–2019, the strategy associated with social technologies states: “I. Preparation of a ‘Science, Technology and Innovation Action Plan in Social Sciences and Technologies’” (BRASIL, 2016, p. 67).

Despite these regulatory acts, in their comparative study of support measures Doroteu, Carvalho and Santos (2018, p. 4,416) concluded: “Instead of public policies, we found the preparation of regulatory acts incapable of changing behavior and customs.” Therefore, besides structuring an effective public policy, the state, together with the system's other participants, must select programs and projects to support.

The second key identified by Edwards, Pertoldi and Morgan (2016) concerns “structural and legislative changes.” As indicated by Doroteu, Carvalho and Santos (2018) and by the gap underpinning this research, Brazil needs to make its social technologies legislation effective. Beyond implementing existing legislation, Senate Bill No. 111 of 2011 moved through the Senate in 2018 and was forwarded to the Chamber of Deputies for approval. Its purpose is to institutionalize the National Social Technology Policy (PNTS), legally define ST and create greater opportunities for government incentives (BRASIL, 2011).

Prioritizing an innovative discovery process in social technologies is another key to success. Currently, the only initiative belongs to a social organization: the Social Technologies competition promoted by the Banco do Brasil Foundation to compose its Social Technologies Database. Institutionalizing the governance model is expected to involve additional actors (EDWARDS; PERTOLDI; MORGAN, 2016).

The final identified key to success is monitoring and evaluation, which should form part of the cycle of any well-institutionalized public policy. The principles and keys to success are implemented through what we regard as a relatively complex governance model.

Final considerations

SS originated as an academic conception and was institutionalized as a European Union public policy binding its member nations. This academically grounded policy, coordinating the quadruple helix, aims to overcome the crisis of the 2000s while preparing Europe for the new society and for developing and meeting demands for technological development.

SS implementation and development are not complete. As a structured public policy, SS proceeds through phases, including implementation, monitoring and evaluation, and is improved accordingly. Similarly, not all EU nations can be treated homogeneously, since economic, political, geographical, cultural and historical diversity exists even within the economic bloc.

SS public policy is conceived for local, regional and national economic development while also fostering human and social development. The policy's conception and application are therefore constructed openly so that it can be reapplied in any EU nation and in other countries.

Besides institutional manuals published by the EU itself, articles and other academic works can be found, although this literature remains incipient.

Regarding diversity, the need to overcome economic crisis and preparation for changes in the new society, Brazil can be compared with the EU. Oriented toward commodity production and exports, its economic activities are somewhat exclusionary. Social technologies have an inclusive, sustainable vocation, offering solutions to issues of various kinds, including job and income creation.

Although ST is mentioned in some public documents, no public policy encouraging its reapplication, improvement, adaptation and development has been institutionalized. Even the National Social Technology Policy, under consideration in the federal legislative houses since

2011, has not been enacted as an ordinary law. This would, at least formally, place ST on an equal footing with so-called “traditional” technologies. State omission is offset by initiatives from society and private organizations.

The experience of society and private organizations is so relevant that even the term's definition resulted from collective construction mediated by the federal government. This relationship between government and actors interested in reapplication, improvement, adaptation and development can be used as social mobilization for implementing public policies focused on these results.

Coordinating actors through public policies for ST reapplication, improvement, adaptation and development must always consider all the expertise developed by these actors thus far without state participation.

Analysis of SS and ST similarities and differences showed that SS focuses on forming a critical mass working at the knowledge frontier to develop new technologies, whereas ST focuses on developing innovative solutions from the knowledge and experience of individuals and/or communities. Nevertheless, both share features allowing experience to be exchanged, particularly regarding the management model.

Certainly, no state structure would bind the people and communities that devise and develop creative solutions to their own problems. More than a thousand social technologies have already been cataloged, offering human, social and even economic development potential unexplored by Brazil for lack of a coordination mechanism. This problem prompted the present research. We sought initiatives or measures applicable to this situation, hence the adaptation of SS practices to promote ST in the Federal District region.

Comparisons between SS and ST showed that the core of the adaptation is establishing a governance model that brings stakeholders together and enables all decisions to involve everyone interested. The state participates as another stakeholder through the State Secretariat for Labor, Social Development, Women, Racial Equality and Human Rights (SEDESTMIDH). Universities contribute knowledge production, dissemination and development of technology-based solutions involving ST. Society is the main beneficiary and, in turn, sustains all other stakeholder categories: people and organizations working on ST reapplication, improvement, adaptation and development.

Future studies could compare SS governance models implemented in Europe with the public governance model regulated in Brazil in 2017. Another study could survey state support measures and investment funds capable of financing ST reapplication, improvement, adaptation and development. Further work could use ST catalogs to identify which activities operate in

areas subject to state regulation and survey initiatives capable of reducing bureaucracy in regulatory measures related to social technologies. Other possibilities include new smart specialization applications in Brazil; the relationship between smart specialization and smart cities; and the relationship between smart specialization and the solidarity economy, since these are interrelated but not synonymous terms.

The proposed model seeks nonhierarchical interaction that brings stakeholders together and coordinates them through collaboration. The timing is favorable in the Federal District given the recent implementation of the Brasília Technology Park, BIOTIC, and the need to make room for social technologies within this project and numerous other state initiatives.

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