

Intelligence in public management: an analysis from an institutional perspective

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Recent studies point out that the barriers to transition and structuring a smart government seem less technological and more institutional. Against this backdrop, this article provides an original contribution to the literature by analyzing the dimensions of intelligence in public management under the lens of institutional theory. Also, from the theoretical debate, the research develops a model of institutionalization of intelligence in public management. The card sorting technique was used to validate the four categories defined from the theoretical analysis (organizational structure, technological structure, human capital, and social engagement). These categories were defined considering the respective dimensions of intelligence: use of data and external information; organizational culture for intelligence; effective use of technologies (Big Data; Business Intelligence); evidence-based decision-making; inter-departmental and inter-organizational collaboration; database organization and unification; government agility; management efficiency and effectiveness; social engagement; innovation, co-creation, intelligence collective. The results point to the importance of incorporating elements from the institutional perspective to legitimize intelligence in government. Also, from the analysis of the card sorting stage, the results demonstrate agreement in classifying items by proposed construct, presenting itself as a future opportunity for the model to be quantitatively tested.

Keywords: intelligence; public management; institutional theory.


A inteligência na gestão pública: uma análise sob a perspectiva institucional

Estudos recentes apontam que as barreiras para a transição e estruturação de um governo inteligente parecem menos tecnológicas e mais institucionais. Nesse intuito, este artigo fornece uma contribuição original ainda não abordada na literatura, com o objetivo de analisar as dimensões de inteligência na gestão pública sob a lente da teoria institucional e, por meio do debate teórico, desenvolver um modelo de institucionalização de inteligência na gestão pública. Para fins de validação das quatro categorias definidas segundo a análise teórica (estrutura organizacional, estrutura tecnológica, capital humano e engajamento social), com as respectivas dimensões de inteligência (uso de dados e informações externas; cultura organizacional para inteligência; uso efetivo de tecnologias [Big Data; Business Intelligence]; decisão com base em evidências; colaboração interdepartamental e interorganizacional; organização e unificação de base de dados; agilidade em governo; eficiência e efetividade da gestão; engajamento social; inovação, cocriação, inteligência coletiva), optou-se pela utilização da técnica de *card sorting*. Os resultados apontam para a importância da incorporação dos elementos da perspectiva institucional para a legitimação de inteligência no governo. Ainda, com base na análise da etapa de *card sorting*, os resultados demonstram concordância na classificação dos itens por construto proposto, apresentando-se como uma oportunidade futura do modelo a ser testado quantitativamente.

Palavras-chave: inteligência; gestão pública; teoria institucional.


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La inteligencia en la gestión pública: un análisis desde una perspectiva institucional

Estudios recientes señalan que las barreras para la transición y la estructuración de un gobierno inteligente parecen menos tecnológicas y más institucionales. Para ello, este artículo brinda un aporte original aún no abordado en la literatura, con el objetivo de analizar las dimensiones de la inteligencia en la gestión pública bajo el lente de la teoría institucional y, a partir del debate teórico, desarrollar un modelo de institucionalización de la inteligencia en la gestión pública. Con el fin de validar las cuatro categorías definidas a partir del análisis teórico (estructura organizacional, estructura tecnológica, capital humano y compromiso social), con las respectivas dimensiones de inteligencia (uso de datos e información externa; cultura organizacional para la inteligencia; uso efectivo de tecnologías (*big data*; *business intelligence*); toma de decisiones basada en evidencia; colaboración interdepartamental e interorganizacional; organización y unificación de bases de datos; agilidad del gobierno; eficiencia y eficacia de la gestión; compromiso social; innovación, cocreación, inteligencia colectiva), se decidió utilizar la técnica de clasificación de tarjetas. Los resultados apuntan a la importancia de incorporar elementos desde la perspectiva institucional para la legitimación de la inteligencia en el gobierno. Asimismo, a partir del análisis de la etapa de clasificación de tarjetas, los resultados demuestran concordancia en la clasificación de ítems por constructo propuesto, presentándose como una oportunidad futura del modelo a ser probado cuantitativamente.

Palabras clave: inteligencia; gestión pública; teoría institucional.

1. INTRODUCTION

Organizations increasingly need quality information to deal with uncertainties of the environment to improve decision-making (Rezende, 2012; Vidigal, 2013). Therefore, it is necessary to consider the data obtained, analyze them, and transform them into information relevant to improve decision-making (Davenport, 1998; Choo, 2002; Janissek-Muniz, Freitas, & Lesca, 2007; Paula & Rover, 2012). In this context, a new generation of information technology application emerges in government, aiming to collect, connect, and analyze generated data sets to be processed (Schedler, Guenduez, & Frischknecht, 2019).

Since the last decade, there has been an increase in research in the area, highlighting the importance of acquiring data to be transformed into information and knowledge for the improvement of decision-making in the public sector (Gil-Garcia, Pardo, & Aldama-Nalda, 2013; H. J. Scholl & M. C. Scholl, 2014). In this sense, Gil-Garcia, J. Zhang, and Puron-Cid (2016) argue that smart governments can feel and react to the environment based on relevant data for decision-making.

The concept of intelligence in the public sector is complex and presented in a broad and multifaceted way (Gil-Garcia et al., 2016). Based on the studies by Chen, Miao, and Wu (2014), Eom, Choi, and Sung (2016), Gil-Garcia et al. (2016), Gil-Garcia, Helbig, and Ojo (2014), Malomo and Sena (2017), and H. J. Scholl and M. C. Scholl (2014), this study understands intelligence in public management as an innovation involving the use of technology to support and improve decision-making, assist in planning public activities by establishing formal structures, engaging civil servants and public managers, and social engagement for the effective management of data and information from the context.

Questions related to intelligence in government have become comprehensive and used to indicate digital initiatives in the public sector: technology that creatively links physical, digital, public, and private environments (Rochet & Corrêa, 2016; H. J. Scholl & M. C. Scholl, 2014) and fosters the orientation of citizens and clients and their participation (Gascó-Hernandez, 2018; Schedler, 2018). Initiatives of intelligence in government also refer to innovation (Gil-Garcia et al., 2014; Mergel, Rethemeyer, & Isett, 2016); service co-design; co-creation (Guenduez, Singler, Tomczak, Schedler, &

Oberli, 2018); proactive services (Linders, Liao, & Wang, 2015); implementing business-like service delivery models (Schedler, 2018); agility (Mergel et al., 2016); the extensive use of technology (Mellouli, Luna-Reyes, & J. Zhang, 2014); information flows; collaborative decision-making (Gil-Garcia et al., 2016; H. J. Scholl & M. C. Scholl, 2014); and use of data power to improve public decision-making (Harsh & Ichalkaranje, 2015). They also include promoting openness, innovation, focus on citizens, population engagement, improving efficiency and effectiveness, and inter- and intra-organizational collaboration in the public sector as central elements (Anthopoulos & Reddick, 2016; H. J. Scholl & M.C. Scholl, 2014).

On the one hand, these studies present the main characteristics and opportunities arising from implementing and developing a smart government. On the other hand, more recent investigations demonstrate that a set of conditions is necessary to achieve the highest level of intelligence in government. This set of conditions may be organizational, technological, and human (Mu, Haershan, & Wu, 2022) and may explain the low applicability of the dimensions of intelligence in government (Melati & Janissek-Muniz, 2020). In addition, some studies point to the need for theoretical advances in the area of intelligence in the public sector concerning its institutionalization since the barriers to the transition and structuring of a smart government seem less technological and more institutional (Halaweh, 2018; Salvador & Ramió, 2020; Vieira & Alvaro, 2018; WeiWei & WeiDong, 2015).

Furthermore, for Gil-Garcia et al. (2016) and Nam and Pardo (2011), government professionals need to know how a more efficient, effective, transparent, and collaborative operation in the management and delivery of services leads to intelligence in governments. For the authors, it is necessary to develop institutional strategies to form such a smarter government, so it can be inferred that the use of dimensions of a smart government contributes to the development of new strategies in public management.

For Eom et al. (2016) and Johnston and Hansen (2011), the individuals' collective capacity is directly involved in the context of intelligence in public management to organize, interact, and offer leadership to overcome complex social challenges, making government more agile and more efficient than the current paradigms. The participation of individuals and groups as collective intelligence is an important element in the consolidation and legitimacy of intelligence in public management and corroborates the institutional theory, which recognizes that the organization is built by the people who work there through the groups and interests and how the relationship with the environment is established (Selznick, 1972).

Studies identify few efforts reported in leveraging the use of social data to subsidize an intelligent opinion of the government, in the effective use of data and information from citizens, in the dynamic interactions between stakeholders, and in the influence and development of public policies (Bernardes, Andrade, Novais, & Lopes, 2017; McBride, Aavik, Kalvet, & Krimmer, 2018; Przeybilovicz, Cunha, Macaya, & Albuquerque, 2018).

The central argument of this study is that the institutionalization of intelligence in public management facilitates the state's action in the face of environmental uncertainties, envisioning the development of new strategies in public policies and qualification of decision-making. According to

Meyer and Rowan (1977, p. 341), “institutionalization involves the processes by which social processes, obligations, or actualities come to take on a rulelike status in social thought and action.” Therefore, the objective is **to analyze the dimensions of intelligence under the lens of institutional theory and, based on the theoretical debate, to develop a model of institutionalization of intelligence in public management.**

2. INTELLIGENCE IN PUBLIC MANAGEMENT

Public administration reforms with a central focus on management efficiency, seeking to reduce costs and obtain results, aim to address more managerial and less bureaucratic foundations (Abrucio, 2007; Paes de Paula, 2005). These reforms contribute to improving the capacity for political decisions and the state’s decentralization with horizontal coordination and modernization of the human management potential (Ribeiro, Pereira, & Benedicto, 2013). Studies such as Gil-Garcia, Helbing, and Ojo (2014) have shown that governments, at different levels and across the three branches (judiciary, legislative, and executive), are adopting tools and applications to respond with agility to the rapid changes in the environment, aiming to provide answers to society’s demands through qualified and effective services (Schaefer, Macadar, & Luciano, 2017).

Initiatives of intelligence in public administration promise a new model for delivering public services despite being at an early stage of development (Schedler et al., 2019). As a new model, these initiatives are presented as an innovation – for Guimarães, Cabral, Ribeiro, and Costa (2021), this means that governments must understand the complexity of innovation and not simply adopt the model for its novelty. The authors point out the need for an adequate organizational and political mandate to support the adoption of this innovation, and public managers have to interact in a network to create the institutional conditions for innovation success.

In addition, several studies on intelligence in government (Cepik, 2005, 1997; Gil-Garcia et al., 2013; Linders et al., 2015; Jiménez, Solanas, & Falcone, 2014; Johnston & Hansen, 2011; Souza, 2005; Viorel & Radu, 2015) argue that there are particular issues in the public sector when approaching intelligence activities. They emphasize the importance of continuous monitoring of the environment and analysis of government data.

For Guenduez et al. (2018, p. 99), “data has an implicit or explicit key role in smart government initiatives.” The collection of data and information offers the opportunity to define more agile government structures (Gil-Garcia, 2013; Gil-Garcia et al., 2014) to improve services (Kennedy, 2016; Nam & Pardo, 2011), increase participation of society and transparency of government actions (H. J. Scholl & M. C. Scholl, 2014), and the possibility of generating new service delivery models (Schedler 2018). In addition, Guenduez, Mettler, and Schedler (2017, In: Guenduez et al. 2018, p. 99) state that “smartness does not end with data analysis and the prediction of events.” Government authorities have to engage with citizens, define new data-driven actions, and face the outcomes of their decisions, “enabling them to actively and passively co-produce and co-create new services.”

A recent study by Guenduez et al. (2018) on smart government success factors showed that the debate on smart government goes beyond technology-related issues, and the success of activities

of intelligence in public management requires managing organizational capacity, environmental requirements, leadership participation, and development of common strategies and standards.

As mentioned before, the concept of intelligence in public management is broad and multifaceted (Gil-Garcia et al., 2016). However, intelligence in public management in this study is understood as an innovation involving the use of technology to support and improve decision-making and assist in the planning of government activities based on the establishment of formal structures, the involvement of public servants and managers, and social engagement for the effective management of data and information collected from the environment (Eom et al., 2016; Gil-Garcia et al., 2014; Gil-Garcia et al., 2016; Malomo & Sena, 2017; Miao, Wu, & Chen, 2014; H. J. Scholl & M. C. Scholl, 2014).

Melati and Janissek-Muniz (2020) mapped ten dimensions that characterize government intelligence in an attempt to reach a conceptual consolidation: use of external data and information (D01); organizational culture for intelligence (D02); effective use of technologies (Big Data; Business Intelligence) (D03); evidence-based decision-making (D04); cross-departmental and interorganizational collaboration (D05); innovation, co-creation, collective intelligence (D06); government agility (D07); management efficiency and effectiveness (D08); social engagement (D09); database organization and unification (D10), as shown in Box 1:

BOX 1 DIMENSIONS OF A SMART GOVERNMENT

Dimensions of intelligence	Definition	Theoretical background
Use of external data and information (D01)	The importance of using data and information that may contribute to public management and are latent in the population.	Gil-Garcia et al. (2013); Gil-Garcia et al. (2016); H. J. Scholl and M. C. Scholl (2014).
Organizational culture for intelligence (D02)	Encourages the culture of awareness and information sharing through networks, collection of external data and information, and effective use of information to develop the work and the public manager’s decision-making.	Lesca and Janissek-Muniz (2015); Schoemaker and Day (2009); Xu (2007).
Effective use of technologies (big data, business intelligence) (D03)	The use of ICTs for different purposes within the government, such as collection, processing, and sharing of data and information that will support decision-making and improve the delivery of public services.	Gil-Garcia et al. (2013); Gil-Garcia et al. (2016); Johnston and Hansen (2011); Linders et al. (2015); Paula and Rover (2012); H. J. Scholl and M. C. Scholl (2014); Wang, Y. Zhang, Li, and Ruan (2016).
Evidence-based decision-making (D04)	Increasing data-driven decision-making through omnipresent use of sensory devices, advanced assessment, and integrated applications allow governments to make informed decisions.	Gil-Garcia et al. (2016); H. J. Scholl and M. C. Scholl (2014).

Continue

Dimensions of intelligence	Definition	Theoretical background
Cross-departmental and interorganizational collaboration (D05)	Sharing data and information among several agencies of the public sector, through collaboration and development of unified public activities to improve services.	Gil-Garcia et al. (2016); Liu and Zheng (2015).
Innovation, cocreation, collective intelligence (D06)	Refining processes; insights on new public policies; new forms of communication between government and society; sharing decision-making by using collective intelligence.	Eom et al. (2016); Gil-Garcia et al. (2016); Guenduez et al. (2018); Juniawan, Sandhyaduhita, Purwandari, Yudhoatmojo, and Dewi (2017); Nam (2016).
Government agility (D07)	Improving the delivery of public service through the massive use of ICT, data and information, and society's participation.	Johnston and Hansen (2011); H. J. Scholl and M. C. Scholl (2014).
Management efficiency and effectiveness (D08)	Efficiency and effectiveness of public management, proper use of ICT, data and information, and society's participation.	Liu and Zheng (2015); H. J. Scholl and M. C. Scholl (2014).
Social engagement (D09)	Society's active participation in the development of public management.	Eom et al. (2016); Gil-Garcia et al. (2014); Gil-Garcia et al. (2013); Johnston and Hansen (2011); H. J. Scholl and M. C. Scholl (2014).
Database organization and unification (D10)	Unification of the government's many databases and integration of its systems.	Melati and Janissek-Muniz (2020).

Source: Adapted from Melati and Janissek-Muniz (2020).

Furthermore, in the analysis of studies on intelligence in public management, four specific categories necessary for its legitimation emerged: organizational structure, technological structure, human capital, and social engagement.

Organizational Structure – redesigning the structure and considering the technical implications of transitioning to a smarter government, in which information is centralized through organizational and management mechanisms (Halaweh, 2018; Salvador & Ramió, 2020; Vieira & Alvaro, 2018; WeiWei & WeiDong, 2015);

Technological Structure – analyzing the practices and real effects of data and information technology and how electronic platforms collaborate to develop and legitimate the activity of intelligence in governments (Chen et al., 2014; Santos, 2018);

Human Capital – developing analytical capacity so that employees can move toward data-based decision-making; hire or develop data scientists to serve in government; carry out research in the field of knowledge management since the government has the data but fails to use it efficiently (Bojovic, Klipa, Secerov, & Senk, 2017; Malomo & Sena, 2017; Smith, 2008; Valle- Cruz & Sandoval-Almazan, 2018);

Social Engagement – refers to establishing co-creation processes gathering government authorities and civil society; implementing open data policies and mechanisms for interaction with the business sector and other social actors. There are insufficient efforts to leverage social data, generate smart opinion in government, and develop dynamic interaction among stakeholders in new public policies (Algebr, Husin, Abdulhussin, & Yaakob, 2017; Bernardes et al., 2017; Calof, 2017; Hidayat & Kurniawan, 2017; Kumar & Sharma, 2017; Li & Liao, 2018; McBride et al., 2018; Przeybilovicz et al., 2018).

Each of the four legitimation categories has great relevance for intelligence in public management. In order to contribute to their consolidation as predecessor constructs toward the institutionalization of intelligence in public management, these categories were linked, based on the area theory, to the ten dimensions of intelligence validated by public managers (Melati & Janissek-Muniz, 2020). The exception of the dimension “social engagement” (D09) is noteworthy. Due to its theoretical relevance, this dimension is considered a legitimation category per se (Box 2).

BOX 2 PROPOSAL TO VALIDATE THE DIMENSIONS OF INTELLIGENCE IN PUBLIC MANAGEMENT PER LEGITIMATION CATEGORY

Category	Associated dimensions	Authors
Organizational Structure (OS)	D01– Use of external data and information. D02 – Organizational culture for intelligence. D05 – Cross-departmental and interorganizational collaboration. D07 – Government agility. D08 – Management efficiency and effectiveness.	Gil-Garcia et al. (2013); Gil-Garcia et al. (2016); Halaweh (2018); Johnston and Hansen (2011); Lesca and Janissek-Muniz (2015); Liu and Zheng (2015); Schoemaker and Day, (2009); H. J. Scholl and M. C. Scholl (2014); Vieira and Alvaro (2018); WeiWei and WeiDong (2015); Xu (2007).
Technological Structure (TS)	D03 – Effective use of technologies (big data, business intelligence). D06 – Innovation, cocreation, collective intelligence. D07 – Government agility. D10 – Database organization and unification.	Chen et al. (2014); Gil-Garcia et al. (2013); Gil-Garcia et al. (2016); Johnston and Hansen (2011); Linders et al. (2015); Santos (2018); Melati and Janissek-Muniz (2020); Paula and Rover (2012); H. J. Scholl and M. C. Scholl (2014); Wang et al. (2016).
Human Capital (HC)	D02 – Organizational culture for intelligence. D04 – Evidence-based decision-making.	Bojovic et al. (2017); Guenduez et al. (2018); Malomo and Sena (2017); Valle-Cruz and Sandoval-Almazan (2018).
Social Engagement (SE)	D06 – Innovation, cocreation, collective intelligence.	Algebri et al. (2017); Calof (2017); Eom et al. (2016); Gil-Garcia et al. (2013); Gil-Garcia et al. (2014); Guenduez et al. (2018); Johnston and Hansen (2011); Kumar and Sharma (2017); Li and Liao (2018); McBride et al. (2018); Przeybilowicz et al. (2018); H. J. Scholl and M. C. Scholl (2014).

Source: Elaborated by the authors.

This relationship between legitimation categories and dimensions of intelligence stresses the relevance of institutionalizing intelligence in public management as an important means of optimizing government, improving decision-making capacity and boosting public service (Shan, Duan, Y. Zhang, T. T. Zhang, & Li, 2021). These improvements occur through effectively using data and information from the context, produced by the various public bodies, and through social participation. Public organizations have to structure the intelligence process and make people aware of the importance of the activities and the need for collective participation (Mu et al., 2022).

The assumptions of institutional theory will be used to support the issue of the institutionalization of intelligence in public management. According to Selznick (1972), it is possible to think of it as a process occurring over time, reflecting historical peculiarities of an organization built by the people and groups that work there and how the relationship with the environment is established. Thus, the analysis based on the institutional theory is opportune to understand how to structure intelligence in the public sector.

3. PRESSUPOSTOS INSTITUCIONAIS INSTITUTIONAL ASSUMPTIONS

In 1957, Selznick published *Leadership in Administration* as the origin of the institutional approach in organizational studies, in which he formulates the difference between organization and institution. The author argues that the organization “is a technical instrument for mobilizing human energies and directing them toward set aims” (Selznick, 1972, p. 5). Regarding the institution, Selznick (1972, p. 5) defines it as “a natural product of social needs and pressures – a responsive, adaptive organism.” To achieve its goals, the organization needs to deal with internal pressures from people’s resistance and with the external influence of habits established by groups. The external environment in the development of organizational activities is important as organizations work as variables that go beyond concrete issues, such as processes and technology – with the influence of the environment and shared values, beliefs, and myths – and the formal structure that emerges from the influences of personal relationships, which may be friendship, prestige, or acceptance (Roethlisberger & Dickson, 1941).

The various actors in the external environment can help or influence the decision of the players conducting the organizational development. For Lesca and Janissek-Muniz (2015), the relevant stakeholders are all those who make decisions that interfere with organizational continuity or sustainability (the reason they must be monitored and considered in decision-making). Thus, a smart organization is capable of collecting data (signals) from its environment (internal and external), synthesizing the signals (obtaining information), processing and making sense of the signals (knowledge), and deciding on actions (Souza, 2005). The organization feeds on the environment in which it is inserted, acquiring knowledge for planning future actions (Choo, 2002) while delivering something. They are open systems permeable to environmental changes and need the information to be processed and used in management and as a means for the organization to contribute to the environment (Katz & Kahn, 1978).

For Meyer and Rowan (1977), practices in institutions are not adopted as a result of a simple calculation defined by efficiency criteria. It goes further since “many formal organizational structures arise as reflections of rationalized institutional rules” (Meyer & Rowan, 1977, p. 340). In this sense, organizations and individuals act driven by cultural and institutional elements, such as myths and ceremonies of a society. This connection to the environment is in line with DiMaggio and Powell’s (1983) findings on mimetic isomorphism, in which organizations can base themselves on other organizations that they perceive to be more legitimate or successful. Such an understanding may come from monitoring the organization’s environment, where it is influenced and exercises influence. To monitor the environment, the perception and practice of intelligence activities must be part of the organization’s culture, which suggests the need for institutionalization.

According to DiMaggio and Powell (1983), institutionalism has ramifications that span different disciplines (economics, political science, sociology) and emphases (governance, regimes, isomorphism, legitimacy). For Meyer and Rowan (1977), “institutionalization involves the processes by which social processes, obligations, or actualities come to take on a rulelike status in social thought and action” (Meyer & Rowan, 1977, p. 341).

How would intelligence activities “take on rulelike status” in an organization? It seems coherent to say that there is a direct relationship with the organization’s culture since the type of culture, through shared values and beliefs, determines whether those involved recognize the information and share it with the environment. This can contribute to the success or failure of institutionalizing the process (Davenport, 1998; Robbins & Judge, 2012).

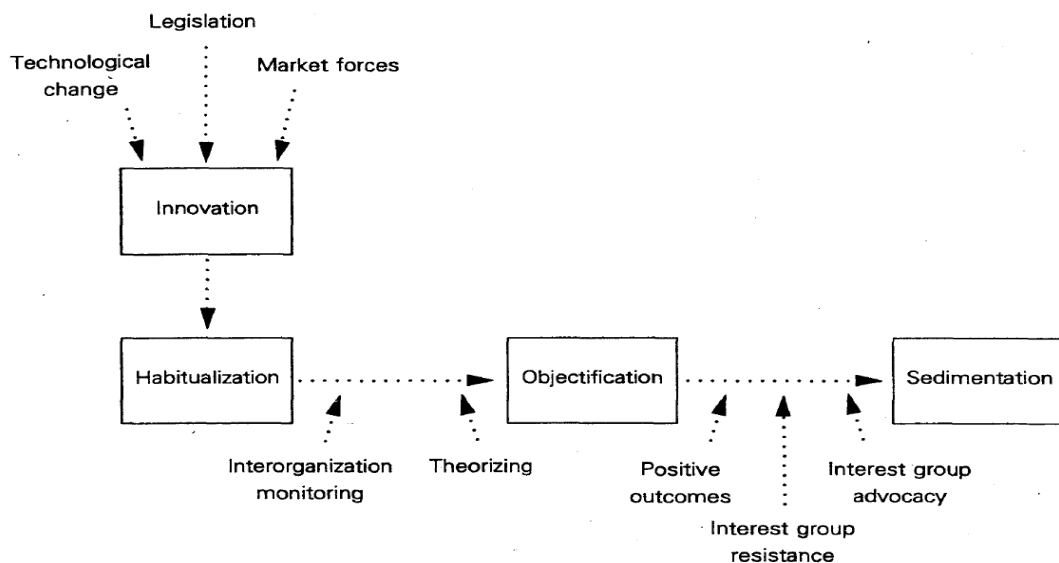
The legitimacy of intelligence in public management goes through the institutionalization of intelligence activities that expand cultural barriers, adapting the organization’s vision – the organization starts to care about using data obtained from the environment, sharing among its members the importance of structuring, disseminating, and perpetuating intelligence. According to DiMaggio and Powell (1983) and Meyer and Rowan (1977), the main assumptions that guide the new institutionalism in the study of organizations are related to the approximation between the organizations’ formal and symbolic spheres started by Selznick’s (1948) old institutionalism. The main assumption of the new institutionalism points out that organizations are linked to a broad context of elements rationalized and institutionalized in society, which are concerned with fields and sectors of action and penetrate the individual’s cognition (Dimaggio & Powell, 1983; Meyer & Rowan, 1977; Zucker, 1977, 1983).

According to the perception of the new institutionalism, it is crucial to understand the organization as belonging to a context that needs to be monitored so that the decisions of public organizations have as basic assumptions the set of data and information arising and produced by society and organizations that influence government activity. This assumption is in line with intelligence activities and the importance of these activities’ legitimacy in public management.

The influence of other public or private organizations is related to the similarity between organizations belonging to the same “organizational field” in which each public agency is located – and these organizations deserve to be monitored and taken into account for their activity. For DiMaggio and Powell (1983), the reasons why organizations seem so similar emerge from the perception that they are part of a larger context, in which there is a set of interrelated organizations in a given field or sector. For Meyer and Rowan (1977), the organization’s action to incorporate elements of the institutional environment happens more as a matter of legitimacy in the face of the “field” than in the search for efficiency.

Institutional theory, especially its historical and sociological aspects, provides important concepts that consider the environmental variable in the process of institutional change, suggesting the importance of studying the institutionalization of intelligence in public management because of the relevance it has acquired over the last decade.

According to Tolbert and Zucker (1999), organizations constantly interact with the environment and adapt to changes through innovations. These innovations sometimes derive from technological changes, sometimes from changes in legislation, or from market forces. For the authors, the institutionalization process starts with innovation, goes through habitualization and objectification, and ends with sedimentation (Figure 1).

FIGURE 1 COMPONENT PROCESSES OF INSTITUTIONALIZATION

Source: Tolbert and Zucker (1999, p. 182).

For Tolbert and Zucker (1999), habitualization refers to establishing behavior patterns to solve organizational problems through which new independent structures are created. In the objectification process, actions acquire a shared meaning, where the greater the dissemination of the structure, the more it will be seen as an optimal and less uncertain choice, triggering mimetic isomorphism. The interest groups within the structure expose failures and dissatisfaction of specific organizations and seek to solve the problem based on a diagnosis. Evidence emerges from many sources (e.g., news, direct observation, analysis of the competition), and objectification occurs as a result of interorganization monitoring. In turn, theorizing offers normative and cognitive legitimacy to the structure. Sedimentation is based on the structure's continuity, its survival through generations. The full institutionalization of the structure probably relies on the combined effects of low interest group resistance, ongoing interest group advocacy and cultural promotion, and a positive correlation with desired outcomes.

The proposed model highlights the importance of individuals and the groups in institutionalizing organizational processes and the relationship between the structure and its context. This model is presented as an initial mechanism to think about the institutionalization of intelligence in public management, given the relationship between the organization and its environment.

After determining the main parameters of the institutionalization process and demonstrating the inherent dimensions of intelligence in public management activities, our next step in this article is to elucidate the institutionalization stages based on the link with the dimensions of intelligence.

4. INSTITUTIONALIZATION OF INTELLIGENCE IN PUBLIC MANAGEMENT

Intelligence in government refers to rethinking public management (Schedler, 2018). According to Haleweh (2018), Salvador and Ramió (2020), Vieira and Alvaro (2018), and WeiWei and WeiDong (2015), the barriers to transitioning to smart government and structuring it seem less technological and more institutional.

Intelligence in public management appears to be related to how the government acts in the face of environmental uncertainties, seeking new strategies to develop policies. It refers to acts based on monitoring the environment, increasing data and information processing capacity, system integration, and training public servants and managers to optimize government management, enhance its decision-making capacity, and improve public service (Shan et al., 2021).

Monitoring the environment must be a continuous and persistent activity in organizations. For Janissek-Muniz and Blanck (2014), this activity occurs through intelligence processes since intelligence is established from the data, the meaning of the information based on this data, and the awareness arising from knowledge, understanding, and learning.

According to the model of Tolbert and Zucker (1999), monitoring the environment is a predecessor, continuous, and important process for activities of intelligence in public management. It is the action of observing the organizations in the environment while they use innovation to adapt to technological changes, legislation, or market forces. If, on the one hand, the government activity of monitoring the environment emerges as a key point of the intelligence process, on the other hand, there is a need for more agile and efficient management processes than the current government paradigms (Johnston & Hansen, 2011). These processes must show the ability to deal with the complexity and uncertainty of the environment (Gil-Garcia et al., 2014; H. J. Scholl & M. C. Scholl, 2014).

In the model by Tolbert and Zucker (1999), intelligence in public management is the innovation to be institutionalized. On the one hand, monitoring the environment and intelligence activities operate as mechanisms to achieve innovation in the public sector. On the other hand, intelligence in public management emerges as a new paradigm that requires scientific research to gather resources to simplify its institutionalization (Schedler et al., 2019). Thus, despite understanding the importance of intelligence in public management as an element prior to the innovation proposed in the original model, this study observes intelligence activities as innovative activities that still lack the legitimacy to become institutionalized in public management.

For Mulgan and Albury (2003), public sector innovation can be understood as new ideas put into practice, which may be related to improving the structure, processes, collaboration between governments, and collective intelligence, among other factors (Nam, 2016).

When considering the perspective of intelligence in public management as an innovation to be institutionalized and following the logic of Tolbert and Zucker (1999), it is possible to identify the process of habitualization, which begins with awareness and is followed by new structural arrangements in the search for solutions to organizational problems. This process is characterized by the normalization of new structures in the organization's policies and procedures, being a stage of the pre-institutionalization of intelligence in public management. This is possibly the stage in which the government understands the importance of structuring intelligence activities to effectively use data and information collected from the environment and produced by public agencies to improve decision-making and seek new strategies and smart solutions to solve problems and apply them in new public policies.

The objectivation process occurs by capturing evidence that may arise from interorganizational monitoring – with the help of various sources (e.g., news, analysis of national or international public agencies bodies, and society as a whole) – and the normative and cognitive legitimacy for the structure of intelligence in public management obtained through theorizing. In this phase, intelligence activity takes on a shared meaning for the government and society. The greater the inherent result of the activity implementation, the greater the dissemination of the structure, understood as an optimal choice by other public agencies, facilitating mimetic isomorphism (DiMaggio & Powell, 1983).

Sedimentation is the final component process of the institutionalization of intelligence in public management, according to the model of Tolbert and Zucker (1999). It is based on continuity and sustainability of activities, with the help of generations of organization members – in the case of public management, it is possible to consider sedimentation beyond government mandates as part of the culture of the state itself (Xu, 2007). Thus, collective work and advocacy from those who believe in the changing power of the use of data and information in government are necessary, supported by the outcomes this approach may achieve. The interest group has to encourage monitoring of the environment and information sharing through governmental and social networks. For the sedimentation of intelligence in public management, the fundamental role of the individual and the group as a means of defending the continuity of the activity is evident, regardless of the changes in government.

The institutionalization of intelligence in public management does not assume a linear process with a defined end. It is presented cyclically as a continuous and perennial process since the government can be considered an open system that constantly adapts to the environment to determine better public policies, offering innovative solutions and strategies to improve the life of society.

As a result of this analysis, Box 3 proposes the subdivision of the dimensions of intelligence and their relationship with the phases of the process of institutionalization of intelligence in public management, based on Tolbert and Zucker’s (1999) model.

BOX 3 PHASES OF THE INSTITUTIONALIZATION PROCESS AND DIMENSIONS OF INTELLIGENCE

Phases of the institutionalization process	Dimensions of intelligence
Habitualization	D01 – Use of external data and information. D03 – Effective use of technologies (big data, business intelligence).
Objectification	D04 – Evidence-based decision-making. D05 – Cross-departmental and interorganizational collaboration. D06 – Innovation, cocreation, collective intelligence. D10 – Database organization and unification.
Sedimentation	D02 – Organizational culture for intelligence. D07 – Government agility. D08 – Management efficiency and effectiveness. D09 – Social engagement. D06 – Innovation, cocreation, collective intelligence.

Source: Elaborated by the authors.

When adopting new structural arrangements is the response to organizational problems (habitualization phase), intelligence in public management is an option to enhance the use of data and information from the environment. Thus, habitualization presents the dimensions of using data and information from the context and the effective use of information technology as mechanisms to aid data storage and processing.

The consolidation of systematization, the use of data and information from the environment, and the recognition of the importance of intelligence in public management lead to the stage of objectification. It is a stage marked by systemic interorganizational monitoring and the observation of the process level in comparison to other public agencies. In this stage, organizations aim to be recognized as the model to be followed, and the efforts are directed to regulate the activity of intelligence in public management by elaborating normative and work instructions and mechanisms to validate and bring about the need to use intelligence in government effectively.

The more evidence-based decisions generate smart solutions for society, the greater the potential recognition of the importance of intelligence in improving public management. The dimensions of intelligence to be highlighted in the objectification stage are database organization and unification, cross-departmental and interorganizational collaboration, the beginning of innovation in processes in the public sector arising from monitoring the environment, and the effective use of technologies (big data, business intelligence).

The outcomes of the first two stages lead to sedimentation, in which the focus is the activity continuity and survival. In this third stage, intelligence becomes part of the organization's culture and presents results of the institutionalization process, generating greater government agility, management efficiency and effectiveness, social engagement, co-creation, and collective intelligence.

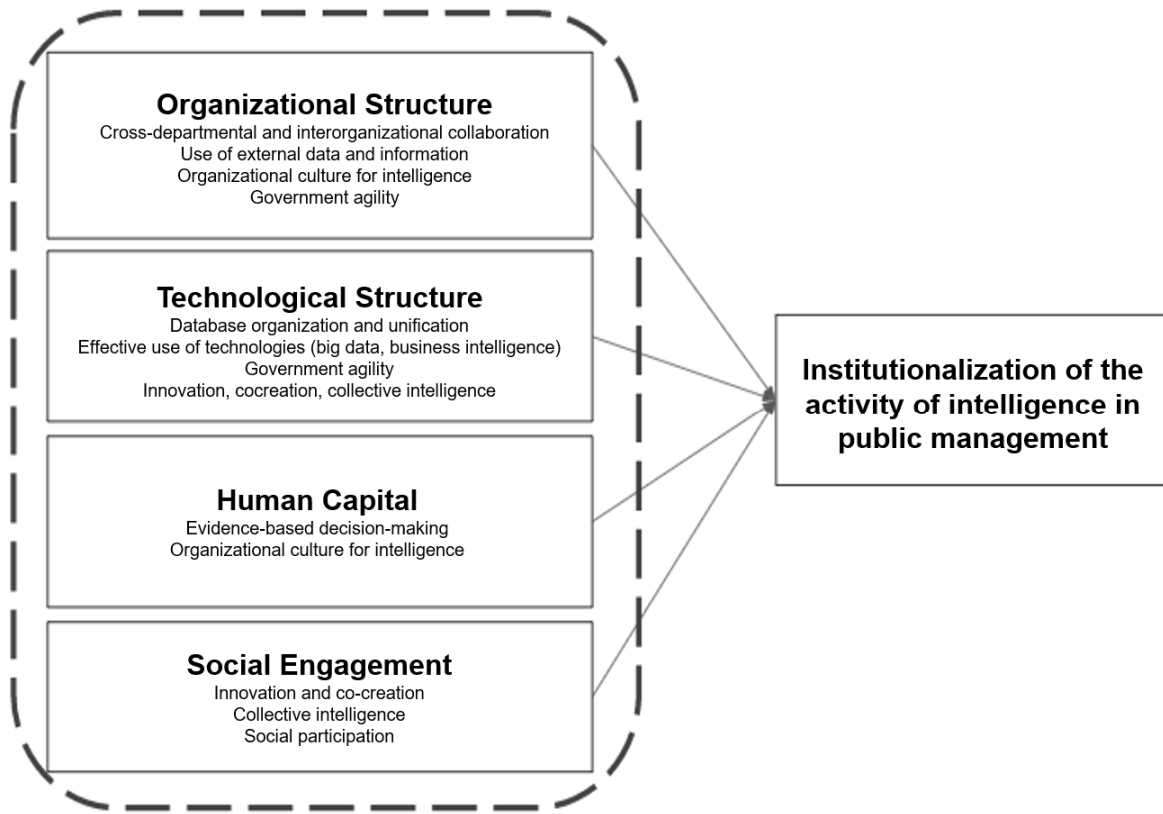
The model of institutionalization of intelligence in public management is presented as a proposal to be validated in field research. The goal is to contribute to the theoretical consolidation of intelligence and help develop the process for governments.

4.1. Theoretical model

The model proposed emerges after this theoretical analysis and aims to understand the influence of the legitimation categories in the institutionalization of intelligence in public management activities based on intraorganizational understanding. Each category is related to the dimensions of intelligence and influences the institutionalization process. Although there is an understanding of the importance of improving the theory regarding the outcomes of intelligence in public management activities in society, this study delineates the analysis of the search for the perception of the public organizations' internal needs, given that intelligence in government is presented as a new organizational arrangement and practice that seeks legitimacy.

Thus, Figure 2 presents a theoretical model to be tested and validated, considering that we did not find studies seeking to understand the impact of the different legitimation categories to consolidate and legitimate the institutionalization of intelligence in public management.

FIGURE 2 THEORETICAL MODEL OF INSTITUTIONALIZATION OF INTELLIGENCE IN PUBLIC MANAGEMENT



Source: Elaborated by the authors.

Based on the model, the legitimation categories and their respective dimensions of intelligence highlighted in Figure 2 were validated using the card sorting technique. For Nahm, Rao, and Solis-Galvan (2002), card sorting is applied in the pre-test phase after obtaining the items from the literature and before applying the final research questionnaire. The technique consists of collecting information that participants can use in a given context, based on the distribution of cards organized according to the understanding of each of the participants, grouped by criteria of similarity or context of use (Rocha, 2008). The study adopted the closed form of the card sorting technique described by Rosenfeld and Morville (2002), in which the cards are already labeled and seek validating structures, using topics of analysis determined beforehand. The set of cards contained labeled information associated with the dimensions of intelligence and a list of categories, briefly described so that they could be related by the respondents (Box 4).

BOX 4 SET OF CARDS FOR CARD SORTING

Legitimation categories leading to the institutionalization of intelligence in public management	Cards 1 – list of dimensions and categories	Cards 2 – descriptions of dimensions of intelligence per legitimation category
Organizational Structure (OS)	OS1 Cross-departmental and interorganizational collaboration	Cross-department and interorganizational collaboration in sharing data and information help develop activities of intelligence in public management.
	OS2 Use of external data and information	Public organizations develop their activities with greater agility by intensifying the use of data and information.
	OS3 Organizational culture based on intelligence	The organizational culture focused on encouraging information sharing through networks and collecting external data and information helps to develop the government's work and decision-making.
	OS4 Organizational culture based on intelligence	Public organizations must adopt effective intelligence processes, using organizational and managerial mechanisms to centralize information.
Technological Structure (TS)	TS1 Database organization and unification	Electronic platforms integration and data unification are important to promote intelligence in public management.
	TS2 Effective use of technologies	Information technologies assist in data and information collection, processing, and sharing within governments.
	TS3 Effective use of technologies	The intense use of information technology streamlines service provision and collective participation in government.
	TS4 Innovation, cocreation, collective intelligence	Electronic platforms collaborate for the collective development of innovations in public management based on collective intelligence.
Human Capital (HC)	HC1 Evidence-based decision-making	Managers and civil servants focused on collecting, using, and disseminating data and information tend to make better decisions.
	HC2 Organizational culture based on intelligence	The development of the public servants' analytical capacity helps to implement intelligence processes
	HC3 Evidence-based decision-making	Hiring or developing government data scientists assists in the effective use and dissemination of qualified data and information.
	HC4 Organizational culture based on intelligence	The engagement of public leaders is important for the development of intelligence activities.

Continue

Legitimation categories leading to the institutionalization of intelligence in public management	Cards 1 – list of dimensions and categories	Cards 2 – descriptions of dimensions of intelligence per legitimation category
Social Engagement (SE)	SE1 Innovation, cocreation, collective intelligence	Co-creation processes between government and society are shown to be important for the development of intelligence in public management, based on collective intelligence latent in society.
	SE2 Social engagement	The effective participation of society is important for the valorization of data and information in the creation of public policies.
	SE3 Innovation, cocreation, collective intelligence	The greater participation of society in government can help in the innovation and improvement of processes, with insights for new public policies from collective intelligence.
	SE4 Social engagement	The development of a dynamic interaction between stakeholders (government and society) tends to generate new public policies by leveraging big social data for a smart opinion in government.

Source: Elaborated by the authors.

Sixteen participants were selected to validate the proposed model, eight scholars, experts in the field of intelligence, and eight practitioners, public managers with experience in information management. They analyzed 16 cards online using the Optimal Workshop application (<https://www.optimalworkshop.com/optimalsort/>). The cards were made available so that participants could express their agreement regarding the adherence between legitimate categories and dimensions of intelligence. Participants showed an excellent level of agreement (considering the Kappa coefficient) for 13 out of the 16 items presented in the cards (Nahm et al., 2002); the other three items obtained a moderate level of agreement (Table 1).

TABLE 1 RESULTS OF CARD SORTING

Set of cards	Agreement in card sorting	Kappa Coefficient
TS01	100%	Excellent (> 76%)
TS02	100%	
HC02	100%	
SE02	94%	
SE03	94%	

Continue

Set of cards	Agreement in card sorting	Kappa Coefficient
SE04	94%	Moderate (between 75% and 40%)
OS04	88%	
HC01	88%	
HC03	88%	
OS01	81%	
TS03	81%	
TS04	81%	
SE01	81%	
OS03	75%	
HC04	63%	
OS02	63%	

Source: Elaborated by the authors.

There was no difference in the level of agreement manifested by practitioners or scholars regarding the relationship between dimensions and the four legitimation categories. After validating these relations as antecedents of the institutionalization of intelligence in public management and the theoretical relationship between the dimensions of intelligence and Tolbert and Zucker’s (1999) stages of institutionalization, future studies should test the influence of the categories of analysis in relation to the institutionalization of intelligence in public management, seeking further validation and theoretical consolidation.

5. FINAL CONSIDERATIONS

This study considers the context marked by the lack of applicability of intelligence in public management activities and the need to strengthen the organizational culture focused on this public management approach. Also, studies suggest that the barriers to the transition and structuring of intelligence in public management seem less technological and more institutional (Halaweh, 2018; Salvador & Ramió, 2020; Vieira & Alvaro, 2018; WeiWei & WeiDong, 2015). Therefore, this research analyzed the dimensions of intelligence in public management under the lens of institutional theory and theoretically discussed a model of institutionalization of intelligence in public management.

In this context, the institutional theory was found adequate to support the institutionalization of intelligence in public management since it may be considered a process that occurs over time and reflects the historical peculiarities of an organization built by people and groups and by how this organization relates to the environment (Selzinck, 1972).

Based on the model of institutionalization proposed by Tolbert and Zucker (1999) – innovation, habitualization, objectification, sedimentation – it was possible to correlate the phases of the model

with the dimensions inherent to intelligence activities, as observed in theoretical constructions about intelligence in public management. The contribution of this research, considering the suggested relationships – connecting legitimation categories, dimensions of intelligence, and institutionalization phases – represents an initial discussion on the systematization of intelligence in public management toward constructing a robust theoretical framework for the area.

The discussions revealed intelligence in public management as an innovation that lacks institutionalization since the studies still point to the lack of theoretical consolidation on the subject and its applicability scope. Furthermore, it is possible to observe a close relationship between the institutionalization of innovation and intelligence as part of the monitoring process that precedes organizational innovation.

The study validates the relationship between the dimensions of intelligence and the four legitimation categories (organizational structure, technological structure, human capital, and social engagement) identified in the literature as antecedents to structure intelligence in public management through institutionalization. This validation allowed us to delimit a theoretical model to be tested – in this case, considering the public management in Brazil – with the help of quantitative analysis techniques, measuring the influence of each of the four legitimation categories on the institutionalization of intelligence in public management.

The theoretical discussion about intelligence in public management based on institutional theory clarified concepts and directions for research associated with the analysis of theoretical paths to legitimate intelligence in public management and future innovation that may lead to positive outcomes in government. The validation of the relationship between dimensions of intelligence and the four legitimation categories toward the institutionalization of intelligence in public management is also a theoretical contribution to the literature.

Regarding the practical contributions, the relationships discussed in this research offer numerous possibilities to develop strategies to improve the application of activities of intelligence in public management. In addition, elucidating intelligence as an innovation to be legitimized based on a model consolidated in institutional theory opens the way for the government to think about other innovations that still lack recognition and legitimacy.

As a limitation of this research, the fact that all public managers who participated in the study work for the government of the State of Rio Grande do Sul, Brazil, stands out, which can lead to similar responses in the card sorting technique applied since they developed their activities in the same context. Notwithstanding, this risk was minimized by including scholars among the participants, and the results did not vary when comparing the answers obtained from practitioners and scholars.

Given the importance of understanding the institutionalization of intelligence in public management, future studies should test, using quantitative analysis techniques, the influence of the four legitimation categories in relation to this institutionalization in Brazil. This line of study will contribute to consolidating the theory and elucidating important ways to legitimize intelligence in public management activity.

Finally, it should be noted that there is a long way to go regarding the studies on intelligence in public management since the theme is changing rapidly, driven by technological evolution and social demand for better services and assertiveness in government decision-making. As points of attention to be explored in future studies are issues related to information security, transparency, security regulation, ethics, and data privacy. These topics address the citizens' trust regarding data processing, considering the unprecedented flow of data and information nowadays, encouraging greater social participation in the continuous improvement of public management.

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