CHANGING PUBLIC ORGANIZATIONS THROUGH INFORMATION TECHNOLOGY

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Abstract
Public organizations are changing by using the potential of information technology to better contribute to value creation moving towards sustainability as a vision for change and action. As strengthening the information technology, public organizations select a community-driven approach and adopt a service logic view as a strategic choice to facilitate public value creation within society. Information technology is leading public organizations to identify a pathway towards sustainability, driving change along a continuum from providing information to managing and using knowledge, and developing smart and digital platforms. Public organizations contribute to value creation, innovation, and sustainability within communities improving technological advances in government to develop digital, smart, lean, and open platforms that enable social and knowledge exchanges.

Keywords
Public organizations, change, sustainability, value creation, information technology.

Introduction

Today, public organizations are changing by embracing information and digital technology to develop better services and promote communication with citizens. Public organizations serve the public interest as the result of dialogue with citizens (Denhardt & Denhardt, 2000), following a sustainability-oriented view as a vision for change to drive public decision-making, management, and governance (Goodsell, 2006; Fiorino, 2010).

Public organizations contribute to facilitating value creation processes by using the potential of information and communication technologies (ICTs) to communicate with citizens and various stakeholders as active co-producers of social, democratic, and public values (Criado & Gil-Garcia, 2019; Moore, 1995).

Technology helps public organizations to drive change, involving civil society within networked governance, developing open innovation, and including external knowledge in decision-making processes (Hartley, 2005; Mergel, 2018). ICTs help drive organizational change enabling technological, human, social, and managerial sources (Orlikowski & Yates, 2006). In particular, ICTs help to support institutional change within public administration (Gascó, 2003) and enable the interface between citizens and government. ICTs facilitate the flows of information within the government and for citizens' rights and access to information (Mayer-Schönberger & Lazer, 2008).

Technologies open up to digital and smart ecosystems where public organizations enable social and public value creation by involving civil society, following a service logic

view, and promoting shared community values in order to support dialogue, and strengthen knowledge and information sharing, social exchanges, interaction, and citizen-centered services effectiveness (Osborne, 2018; Dumay, Guthrie & Farneti, 2010; Stoker, 2006; O'Flynn, 2007; Moore, 1995).

ICTs help public organizations drive networks that involve private and public actors, developing knowledge and capabilities in the pursuit of public goals (Janowski, Pardo & Davies, 2012). ICTs help strengthen collaboration and support the exchange between governments and civil society for service innovation, governance, administration effectiveness, and support to institutional reform (Lips, 2012). Change helps to transform e-services, relying on users' perspectives to create sustainable shared values (Osman, Anouze, Irani, Lee, Medeni & Weerakkody, 2019).

ICTs are driving public organizations as digital and smart communities to support public value creation within open ecosystems (Larrson & Grönlund, 2014; Granier & Kudo, 2016). New technologies enable lean government and platform-based governance (Janssen & Estevez, 2013), and help public governance processes leading to supporting sustainable communities through participatory planning and governance (Estevez & Janowski, 2013). Promoting knowledge management helps public organizations to become smarter institutions that interact with citizens to achieve benefits for society (Wiig, 2002). Developing a strong knowledge management capability helps to improve organizational effectiveness. Public organizations need to develop strong knowledge management capabilities as a reaction to the human capital crisis due to retirement and downsizing (Pee & Kankanhalli, 2016). ICTs help to transform public organizations by developing a knowledge management approach in defining public policies (Edge, 2005) and developing effective two-way transfers of knowledge between public organizations and stakeholders for sustainable policy solutions (Riege & Lindsay, 2006). For developing and implementing smart solutions, public administration might cooperate and transfer knowledge and solutions from the business environment (Pinzaru, Zbuchea, & Vitelar, 2018).

Even if some studies elucidate the importance of information technology as a source to enable innovation and transformation of public organizations, few studies investigate how public organizations are changing using the potential of information technology, how public organizations are interpreting a view for change in embracing digital technologies. Thereby, technology is an enabler of forces that drive public organizations into change. The study aims to elucidate how changing public organizations use technology to support both organizational infrastructures and knowledge-based systems and processes as a means that enable change. Technology helps to develop digital and smart institutions that enable knowledge management approach and openness view as values and drivers of change within sustainability-oriented public organizations.

The use of information technology drives public administration to follow a sustainability-oriented view for change within public organizations that rediscover the importance of developing an orientation towards a knowledge management approach, developing the potential offered by information technology to build a community vision by encouraging the participation of citizens in public policy and services design.

The contribution of this study is to propose a framework of analysis to identify how public organizations are changing by embracing ICTs to develop as knowledge, open, and community-oriented institutions.

This study relies on the analysis of literature that refers to the relationship between ICTs and knowledge management, openness, and smart and digital advancements in designing and promoting the relationships between public organizations and citizens.

Technology contributes to influencing the extension of change and exerting influence on three areas of managerial capabilities and development: implementing a knowledge management approach; strengthening a community vision by smart and digital platforms opening up to a new season of the relationship of confidence between the citizen and the government.

The paper is structured into six sections. Following the introduction and methodological section, the third paragraph elucidates the role of information technology within public organizations which are changing by embracing a service logic view. The fourth paragraph identifies the areas for driving change as enabled by the advent of information technology: developing a knowledge management approach to processes and systems; developing a community vision by strengthening digital and smart platforms for value creation. In the fifth paragraph, a framework of analysis is elucidated and the discussion follows. Finally, conclusions are outlined.

Methodological section

The study is theoretical and relies on a literature review relating to public organizations that aim to change by embracing information technology to develop knowledge management processes and promote a community-oriented vision by strengthening digital and smart platforms to contribute to value creation and public wealth. The selected contributions refer to the relationship between ICTs and knowledge management in order to enable digital and smart platforms as the evolution of advanced information technology in government. The selected contributions are interpreted in a narrative synthesis to elucidate new perspectives and advance theoretical frameworks on emerging issues (Denyer & Tranfield, 2006; Dixon-Woods, Agarwall, Young, Jones & Sutton, 2004).

Changing technology-enabled and service logic-driven public organizations

According to Osborne and Brown (2005) change refers to the gradual improvement and development of the existing services provided by a public sector organization. Today, public organizations adopt a public value management view as a vision for change and value creation (Stoker, 2006; O'Flynn, 2007), moving towards an ecosystem and community view to sustaining knowledge and public value creation within society (Osborne, 2010). Co-production helps drive public value co-creation involving public service users and the community in the services delivery process, leading to active citizenship and active communities (Osborne, Radnor & Strokosch, 2016).

Electronic government is emerging as a catalyst for driving strategic and organizational change within public organizations (Yeo, 2009). Technology provides resources that open up to successful change within public organizations promoting value creation processes, involving civil society, and promoting collaborative processes (Fernandez & Rainey, 2006). ICTs enable change in advancing a public value perspective in driving public sector reforms (Cordella & Bonina, 2012), thereby paying attention to the risks of bureaucratization (Cordella & Tempini, 2015). In particular, the use of ICTs helps change leading to different governance structures and processes that enable changes in norms and public values (Bannister & Connolly, 2012). ICTs help strengthen public values leading to transformational change in government (Bannister & Connolly, 2014).

Public organizations adopt a sustainability-oriented approach as a vision for managing *res publica* within communities and creating value within ecosystems (Fiorino, 2010; Goodsell, 2006; Dumay, Guthrie & Farneti, 2010) by engaging stakeholders and involving civil society in constructing governance networks and shared partnerships (Hartley, 2005). In particular, public organizations contribute to stressing a community-oriented approach to solving problems that refer to the public sphere by fostering cross-sector collaboration that enables information, capabilities, and activities sharing (Bryson, Crosby & Stone, 2006). So, public organizations adopt a new public service to drive policies and practices in interacting with citizens (Denhardt & Denhardt, 2000).

Public organizations adopt a service logic view (Osborne, 2018), promoting collaborative processes to achieve policy objectives within a community (Bourgon, 2007). Public organizations drive change enabling the users to create value because «it is the citizen and/or service user who creates the performance and value of public service, with the PSO acting as a facilitator of this process» (Osborne, 2018, p. 229).

Information technology enables the transformation of government structures and the quality of government services by reducing costs and increasing productivity (Gil-Garcia & Pardo, 2005). Information technology is enabling transparent, participatory, collaborative, and open government leading to cultural change and citizen engagement (Mergel, 2012). ICTs help drive organizational and institutional change within public administration (Gascó, 2003; Orlikowski & Yates, 2006) for public value creation (Moore, 1995), and improving the administrative action and enabling the government to better connect with citizens (Meijer, Bannister & Thaens, 2012).

Information technology helps cultural and operational change within public administration by enabling a knowledge management approach in process management, revitalizing democratic values, and citizen participation, leading to digital and smart platforms for value creation. Information technology helps change within public organizations improving the efficiency of services (e-government) (West, 2004), providing new structures of domination, legitimation, and signification (Meijer & Zouridis, 2004), and enhancing democratic processes by involving citizens in policy-making and fostering public values like transparency, participation and accountability (e-governance) (Dawes, 2008).

Information technology enables public organizations to change managing knowledge by developing smart and digital platforms that enable public value creation. Public organizations need to learn how to use and manage knowledge for efficiency and quality of public services (Massaro, Dumay & Garlatti, 2015), developing knowledge strategies

by jointly considering technology, culture, structure, and people (Syed-Ikhsan & Rowland, 2004) to use, disseminate and share knowledge to achieve social and economic issues (Bratianu & Bolisani, 2015; Leon, 2013). The use of information technology helps development and sustainability by fostering knowledge management processes and citizen participation and governance (Al-Sudairy & Vasista, 2012).

ICTs are driving digital and smart public organizations that contribute to supporting public value creation (Granier & Kudo, 2016), relying on sustainability as a view that relates to general issues, complex interactions, and critical lens to highlight a dialogue of values (Larrson & Grönlund, 2014; Larrson & Grönlund, 2016).

By using information technology, public organizations are becoming smart institutions engaging citizens' engagement and participation. In particular, «citizens' engagement means that citizens have to believe that their engagement is consequential and will have a positive impact on their community» (Mellouli, Luna-Reyes & Zhang, 2014, p.2).

How information technology helps change within public organizations

Information technology can emerge as a source to drive innovation and change within public administration concerning strategic, organizational, and managerial issues. Changing public organizations follow a community-oriented vision driving digital and smart platforms as spaces for dialogue, moving from an information provision approach to using information technology to develop knowledge management in processes.

Rediscovering a pathway from information to knowledge management

Investigating the aspects related to knowledge management in the public sector is becoming a relevant research theme. Knowledge management refers to what an organization knows and implies to transform data in information to use and value it as a strategic source (Bellamy, 2003). According to Wiig (2002), knowledge management in public administration helps develop decision making and participation in public services, and enable intellectual capital capabilities and a knowledge-competitive workforce.

Even if knowledge management contributes to improving both individual and organizational performance, public sector organizations have still to explore the possibilities of knowledge management applications (Edge, 2005). According to Henry (1974), knowledge is emerging as the central force in technology-enabled society and the indispensable resource in public policy processes. In particular, the role of information technology is to enable to maximize the knowledge of decision-makers. Public organizations use technology to support inter-organizational collaboration, by sharing, applying, and creating knowledge (Pee & Kankanhalli, 2016). «Technology is a key enabler of KM and modern KM initiatives typically involve the implementation of technologies such as electronic knowledge repositories, expert directories, and discussion forums» (Pee & Kankanhalli, 2016, p. 189). According to Syed-Ikhsan and Rowland (2004) «technology plays key roles in managing knowledge in an organization and can be considered as an effective means in of capturing, storing, transforming and disseminating information» (p. 108). In particular, «ICT infrastructure seems to allow

individuals in the organization to create and share knowledge effectively and contribute to the performance of knowledge transfer» (Syed-Ikhsan & Rowland, 2004, p. 108).

Managing knowledge as a fundamental resource in public policy formulation helps responsive governments meeting the needs of citizens to design and implement information systems by using technology to improve the organizational processes (Gates, 1975; Henry, 1974). Developing knowledge management within public administration helps improve the quality of life of citizens within society (Wiig, 2002).

Following a knowledge-driven and sustainable-oriented view, public sector organizations learn how to create, use, manage and share knowledge to contribute to value creation processes achieving social and environmental issues (Massaro, Dumay & Garlatti, 2015; Bratianu & Bolisani, 2015; Leon, 2013). Moreover, public organizations should move from an information management approach to knowledge management vision to driving and restructuring systems, processes, and operations. Technology is a key driver for enhancing and implementing knowledge management processes to sustaining organizational culture within public organizations (Girard & McIntyre, 2010). People, processes, and technology enable knowledge management processes within public organizations. Developing technological and organizational sources and infrastructures open up to knowledge management vision and culture within public administration processes (Cong & Pandya, 2003).

ICTs help to transform public organizations by driving innovation and developing a knowledge management approach to defining public policies (Edge, 2005), strengthening knowledge management-oriented processes, and fostering citizen participation and governance (Al-Sudairy & Vasista, 2012). In particular, the employees who use information technology applications help support employee knowledge sharing (Kim & Lee, 2006). As knowledge-driven and technology-enabled responsive institutions engaging citizens, public organizations develop effective two-way transfers of knowledge between public organizations and stakeholders to better develop sustainable policy solutions (Riege & Lindsay, 2006).

ICTs help support knowledge management development and implementation within public sector organizations (Suurla, Mustajarvi & Markkula, 2002). Thereby, while information management systems are well developed, technology tools for governing knowledge management sources are still in infancy. Public organizations have to invest in information technology systems and sources to drive knowledge management systems in transitioning from infancy to maturity in order to enhance knowledge as a source for value creation (Cong & Pandya, 2003; Wiig, 2002). Technology helps public organizations to develop knowledge management systems and enhance knowledge sharing culture using knowledge as a source to improve public services quality, accessibility, productivity, and innovation (Fang, 2002).

Rediscovering a community-oriented view through digital platforms

The use of ICTs in government and digital information throughout society enables an efficient, transparent, and effective government. Following a public management perspective, the digital government is a critical aspect of innovation, co-production, transparency for public value creation (Gil-Garcia, Dawes & Pardo, 2018). According to Osborne, Radnor, and Strokosch (2016) value can be co-created «by the meeting of

community needs through co-production in a way that adds to society» (p.645). The advent of ICTs and the Internet in government processes help to strengthen services co-production following a community-participation approach (Osborne & Strokosch, 2013), opening up to a new digital governance era in terms of citizen-centered processes that facilitate the interaction government-citizen and drive the transition to client-based re-organization and services digitalization. In particular, a digital era strategy governance strategy helps the government's agility, responsiveness in service delivery, increasing citizens' capabilities for solving social problems (Dunleavy, Margetts, Bastow & Tinkler, 2006). Developing the potential of information technology helps to achieve effective benefits for communities and supports citizens' engagement as a source to drive the government to formulate decisions by integrating the point of view of citizens who need to be empowered to meaningfully contribute to policy processes (Mellouli, Luna-Reyes & Zhang, 2014).

Developing a smart government relies on building a creative mix of emerging technologies and innovation (Gil Garcia, Helbig & Ojo, 2014). The digital government relies on creating a digital ecosystem for public value creation by strengthening cooperation and opening to a data-driven culture and strategy ensuring openness, inclusiveness, engagement, and participation in policy-making and service design to better serve citizens and business that access to social and informative exchange (OECD, 2014).

In particular, Web 2.0 is driving e-government towards integration and participation in terms of knowledge and services for active citizen engagement (Dixon, 2010). Promoting Government 2.0 means constructing collective leadership and motivate citizens to engage in facing a problem and be involved in policy processes (Meijer, Koops, Pieterson, Overman & Tije, 2012). Web-based technologies contribute to facilitating the deployment of platforms that support performance and innovation within public organizations. The use of platforms enabled by Web 2.0 technology supports transparency, collaboration, and participation. Government 2.0 enables citizens to collectively create public information and take part in policy processes and innovation in services provision (Nam, 2012).

The role of digitalization is to facilitate and accelerate change within public organizations. In particular, the digital government has shown the effective capacity to achieve expected benefits (Castelnovo & Sorrentino, 2018). E-government maturity models relate to technology as a source for human-centered change to benefit both customers and citizens (Andersen & Henriksen, 2006). Promoting change relies on developing a community/citizen-centered approach, strengthening the potential of information technology by enhancing digital sources and virtual communities, developing networked co-production of public services (Meijer, 2011; Bovaird, 2007).

Technology helps empower the citizen as a responsible partner who contributes to delivering public services (Linders, 2012). Technology enables smartness in government by enabling openness and knowledge (Gil-Garcia, Zhang & Puron-Cid, 2016), and opening up to successful digital policies that enable public-private collaborations to achieve shared objectives for value creation (Ansell & Törfing, 2014; Dawes & Pardo, 2002).

The advent of interactive and digital technology helps public organizations to adopt and strengthen a community/citizen and smart approach to support public values, equity, and development (Larsson & Grönlund, 2014; Dunleavy, Margetts, Bastow & Tinkler, 2005).

Building digital platforms and spaces helps develop services co-production and value co-creation (Fishenden &Thompson, 2013) to promote innovation and transparency, and support citizen engagement, knowledge, and information sharing (Harrison, Pardo & Cook, 2012). Digital technologies are leading public organizations to promote policy-driven e-governance platforms (Janowski, 2015), as smart communities that rely on proactive citizens' participation, and spread smart culture, empowering citizens as co-designers and co-producers of public services for innovation and knowledge development (Larsson & Grönlund, 2014; Gil-Garcia, Zhang & Puron-Cid, 2016).

Discussion and conclusions

As sustainable change-oriented institutions, public organizations develop a knowledge approach to processes that orient administrative action, leading public organizations to embrace digital and interactive technology to build a community approach to value creation processes.

As knowledge-driven and open institutions, public organizations aim to promote collaboration, encouraging inter-organizational and long-term relationships, and interacting with civil society. Public organizations develop the potential of information and communication technology to advance digital, smart, and open communities as spaces and platforms that help encourage partnerships and collaboration among private and public actors, sustaining cooperative efforts to support the creation of social and digital ecosystems.

As shown in figure 1, the main contribution of this study is to identify some pathways that enable public organizations as public value-oriented and sustainable-driven organizations that contribute to the wealth of communities within social and digital ecosystems.

	from information provision	to managing knowledge
from technology in government	Public Organizations managing information	knowledge-driven Public Organizations
to digital and smart platforms	Public Organizations building relationships	Public Organizations sustainability-oriented
	from public services	to service logic view

Figure 1. How public organizations are changing through information technology and knowledge

Public organizations consider sustainability as a source for change that helps to drive value creation processes and enables the wealth of people and businesses, ensuring social, financial, economic, and democratic performances. As managing information, public organizations introduce technology to provide information accessible to citizens and support the efficiency and effectiveness of public services. By developing digital and smart platforms, public organizations tend to develop relationships within the community. In transitioning from the introducing technology to smart and digital platforms development, public organizations are changing by developing a knowledge orientation to designing and implementing work systems and processes, following a service logic view, moving from being knowledge-driven to sustainability-driven organizations that invest in knowledge as a source that helps support and drive continuous change over time.

Developing digital and smart platforms offers a means for public organizations that are changing by following a knowledge management approach in enabling public organizations, companies, groups, and people to interact for engendering new knowledge for policies and value creation processes.

Conclusions

Today, public organizations are facing the challenge of modernization using the potential of information technology to anticipate and drive changes by involving all the actors within the community and strengthening knowledge management-oriented processes as means to achieve public value.

Change always concerns the life and development of public organizations over time. Technology helps drive organizational and strategic change. Information and digital technologies open up to public sector organizations that take opportunities to face challenges and problems related to efficiency, effectiveness, equity, and democracy in redesigning and driving the relationships with citizens and/within communities.

In particular, sustainability and change emerge as drivers that help identify a value-oriented pathway that concerns the improvement of the relationships between public administration and communities. As developing the potential of information technologies, public organizations select both service logic and community-oriented views to drive change and address value creation processes, adopting a knowledge management perspective to innovation systems, developing digital and smart institutions.

In this study, there are theoretical, managerial, and organizational implications. Developing the potential of information technology in government helps public organizations to promote a knowledge management approach building collaborative spaces for social and information exchanges and shared values, promoting a public value view to driving change and innovation. The advent of digital, smart, and interactive technologies helps social and cultural change, enabling policies that foster the continuous search for the interaction between the public sphere and community sphere, following an evolutionary approach to living the change. Technology-oriented changes contribute to reshaping and redesigning the structure of public organizations leading to

a more flexible and *ad-hoc* organization able to learn how to continuously contribute to value creation processes.

In this study, there are some limitations. This study provides a framework of analysis to drive change within public organizations that follow a sustainable view of public value creation within communities. There are no empirical research and case studies. Public organizations are still in infancy in dealing with technology for change and viewing sustainability as a source that enables innovation in governance and services design.

Further research perspectives imply investigating how local autonomies and governments design and implement managerial, organizational, human resources, and technological policies and practices. Technological advancements and digital platforms contribute to enhancing the community development within public organizations that interact with civil society to develop knowledge capabilities, value-oriented processes, and shared culture within public sector ecosystems.

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