

## Open innovation in the public sector: A research agenda

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## Open Innovation in the Public Sector: A Research Agenda

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### Abstract:

New models of innovation are emerging in the marketplace and these are rapidly replacing traditional corporate research labs as the sole source of new ideas, new technologies, and new practices. This trend is being fueled by the ready availability of venture capital, and more importantly, by the ubiquitous presence of information technologies (IT) that are enabling firms to identify and foster new ideas from a myriad of knowledge sources, which could be geographically dispersed. This de-centralized and un-directed form of innovation, referred to as “open innovation”, is gaining traction both in the private and public sectors. In this guest editorial for the Special Issue on Open Innovation in the Public Sector, we first explore the diverse issues that are engendered when implementing open innovation in the public sector, and the IT that can facilitate such initiatives. Next, we highlight the fundamental differences in terms of focus, aim, value, and external stakeholders of open innovation in the private vs. public sectors. Last, we describe an agenda for research on open innovation in the public sector based on trends and gaps in the literature as seen from papers that were submitted to this special issue. Specifically, we suggest several useful directions for future research including conducting domain-specific studies, examining the use of tools beyond social media, and expanding the existing set of research methods and theoretical foundations.

### Highlights:

- 1) The paper sets out various challenges for open innovation in the public sector.
- 2) It highlights the role of IT in fostering such innovation.
- 3) It provides a comparison of open innovation in the private vs. public sector.
- 4) Based on trends and literature gaps, it suggests 3 broad directions for future research on the topic i.e., conducting domain-specific studies, examining the use of tools beyond social media, and expanding the existing set of research methods and theoretical foundations.

## 1. Introduction

Innovation has been pursued by organizations as a crucial activity for ages. In the erstwhile closed model of innovation, organizations themselves create ideas and take care of the development and distribution of these innovations on their own (Chesbrough, Vanhaverbeke, & West, 2014), e.g., the discovery and commercialization of Nylon at Dupont’s Research Lab. Although the closed innovation model worked well for most of the 20<sup>th</sup> century, several developments at the end of this century made it more and more difficult for firms to control the

creation and flow of their ideas and expertise. These developments include the growing number and mobility of knowledge workers, as well as the significant increase in the availability of private venture capital (Chesbrough, 2006). Further, knowledge monopolies started to disappear as the quality of university scientific research improved and the means for this research and its outcomes to be distributed became widespread (Chesbrough, 2003). These changes have supported the creation of new companies and the commercialization of ideas, spilling outside the bounds of company research labs.

The aforementioned developments have led to a new model of innovation, referred to by the term “open innovation” in the literature (Chesbrough et al., 2014; Gassmann, Enkel, & Chesbrough, 2010). In the open innovation model, companies do not adhere to the philosophy that successful innovation requires control, but recognize that internal ideas can be commercialized by deploying them outside (and external ideas deployed in-house) as pathways to the market (Chesbrough, 2006). On one hand, business value can be created by commercializing internal ideas through channels outside of the organization’s current businesses. On the other hand, the knowledge and expertise of smart individuals from outside the company could be tapped for innovation. This has resulted in innovations being generated from sources that were earlier unlikely to contribute towards innovation e.g., customers in online innovation communities (Li, Kankanhalli, & Kim, 2016), and solvers in crowdsourcing sites (Ye, & Kankanhalli, 2015). A number of companies have successfully employed open innovation practices such as, Procter & Gamble, and Dell (Frey, Luthje, & Haag, 2011).

## **2. Issues of open innovation in the public sector**

Other than the rise of open innovation in private businesses as mentioned above (Gassmann et al., 2010; Ye, & Kankanhalli, 2013), a growing number of public sector organizations are also undertaking open innovation initiatives (Bommert, 2010). Particularly, the closed innovation model does not sufficiently address emerging policy challenges that governmental organizations need to deal with, thus driving the need for open innovation in the public sector (Bommert, 2010). For example, the United States Government has made important commitments to the Open Government Initiative (Obama, 2009, 2012), allowing members of the public to access government data, and contribute ideas and expertise to government policy making and services innovation (Lee, Hwang, & Choi, 2012). Another example is that of De Publieke Zaak ([www.depubliekezaak.nl](http://www.depubliekezaak.nl)) in the Netherlands, a combination of projects that allow government agencies to innovate using insights from citizens. One of these projects is the “21 days of debate” effort where citizens could ask questions to (changing) panels of participating politicians during the last 21 days before an election. In other parts of the world, too, open innovation initiatives are gaining ground. For example, the Singapore Government has implemented an open data portal to make datasets from a large number of agencies available to the public (Yang, & Kankanhalli, 2013).

However, public sector organizations are mostly in the early stages of adoption of open innovation (Ham, Lee, Kim & Choi, 2015). Particularly, open innovation in the public sector

requires governments to listen more to their citizens than they did before, and to involve users of public services more. However, the means and methods for citizens involvement in public sector innovation are still not mature (Bekkers, Tummers, & Voorberg, 2013). Furthermore, there is a lack of understanding of how open innovation strategies should be formulated in public sector organizations (Christos et al., 2013). These hurdles result in low levels of citizen satisfaction and trust in these services. Moreover, government organizations must comply with existing rules and regulations that may limit their freedom to innovate, and that too in collaboration with external sources (Mergel & Desouza, 2013). In general, the public sector has been criticized for being inhospitable to innovation due to asymmetric incentives, lack of an innovation culture, absence of funding (such as venture capital) for innovation, and various other barriers (Bekkers et al. 2013). These barriers and the limited understanding of such phenomena in the public sector have led to calls for further research on open innovation in the public sector (e.g., Mergel 2014). This gap is further aggravated by the differences between the two sectors (as discussed next), whereby findings about open innovation in the private sector may not be directly applicable to the public sector.

### **3. Open innovation in the public versus private sector**

While open innovation has gained research attention and popularity in private companies it can also lead to benefits when applied to the public sector, though of a different nature (Konsti-Laakso, Hennala, & Uotila, 2008). Indeed, beyond fundamental differences in ownership, funding, and control, and even as they import practices from the private sector, public sector organizations continue to retain distinctive characteristics. Table 1 provides a comparison of open innovation in the private vs. public sector in terms of its focus, aim, value and external stakeholders. First, the focus of open innovation in the private sector is on both new product and service development, whereas open innovation in the public sector is typically not targeted at creating a physical artifact (Lee et al., 2012). For instance, Procter & Gamble developed its Tide Plus product collection using external inputs from its open innovation website. However, open innovation in the public sector focuses on changes in the form and content of services by transforming the underlying problem understanding, policy objectives, and program implementations (Sørensen & Torfing, 2011). Examples of open innovation in the public sector include garnering citizen inputs for improving city plans, such as the Future Melbourne program<sup>1</sup> in Australia. Second, in contrast to the private sector, where innovations are aimed at achieving competitive advantage, public agencies primarily engage in innovation in order to enhance service performance and public value (Konsti-Laakso et al., 2008). Particularly, open innovation in the private sector could enhance competitive advantage through access to external expertise, shorter time-to-market, and reduced failure rates of innovations (Guertler & Lindemann, 2016). On the other hand, open innovation in the public sector could lead to an improved awareness of social problems, more effective services deriving from broad citizen inputs, and increased trust between governments and citizens (Mergel & Desouza, 2013).

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<sup>1</sup> <http://www.futuremelbourne.com.au/wiki/view/FMPlan/WebHome>

	<b>Open innovation in the private sector</b>	<b>Open innovation in the public sector</b>
<b>Focus</b>	Both on new product and service development	Usually not for a physical artifact
<b>Aim</b>	Initiated primarily to achieve competitive advantage	Driven by the objective of improving service performance
<b>Value</b>	Add value in terms of higher revenues	Add value in terms of public benefit
<b>External Stakeholders</b>	Suppliers, customers, competitors, partners, research institutions, organizations in other industries	Citizens, online intermediaries, academia and higher education, other governmental organizations (e.g. legislators), non-governmental agencies (including the private sector) and non-profit organizations

Table 1: Differences between Open Innovation in the Private and Public sectors  
(adapted from Bommert, 2010 and Lee et al., 2012)

Third, not only are there differences in the focus and aims of open innovation in the public and private sectors, the types of value created through open innovation may also differ. The open innovation paradigm in the private sector is used to generate value in terms of higher revenues (Bommert, 2010), i.e., the company itself should benefit from the innovation. Conversely, public sector open innovation goes beyond serving the focal organization, and more importantly involves the generation of public value (Bommert, 2010).

Fourth, the aims of open innovation in the public and private sectors also implicate the stakeholders that are involved in the innovation process. The role of stakeholders in open innovation is mostly defined by the match between innovation resources and the problem at hand (Bommert, 2010). In the private sector, open innovation involves external stakeholders such as suppliers, customers, competitors and partners, academic and research institutions (Huizingh, 2011; Lee et al., 2012). In the public sector, open innovation involves other kinds of external stakeholders, including citizen networks, online intermediaries, academia and higher education, other governmental organizations (e.g., legislators), non-governmental organizations (including the private sector) and non-profits (Lee et al., 2012). Indeed, with the complexity and variety of stakeholders in the public sector, prior research suggests that public sector innovation should involve dispute resolution (Cunningham & Kempling, 2009) and a continuous process of interaction and negotiation among various stakeholders (Lee et al., 2012). The differences between the two sectors discussed above suggest that findings about open innovation in the private sector may not be directly applicable to the public sector, and thus public sector open innovation must be researched in its own right.

At the same time, while emphasizing the need for open innovation in the public sector, researchers (e.g., Criado, Sandoval-Almazan, & Gil-Garcia 2013) have also highlighted the important role of information technology (IT) to generate and deliver innovative public services.

#### **4. The role of IT in open innovation in the public sector**

Over the past two decades or so, public agencies and departments at all levels have been taking advantage of the advancements in IT to formulate e-government initiatives that: 1) develop official websites for efficient dissemination of government information to citizens and other stakeholders, 2) improve flows of information within and around government, and 3) enhance the efficacy of service delivery to citizens. These initiatives were undertaken with a view that speeding up the process of information provisioning is, by itself, “opening up” government (Chadwick and May, 2003). However, these efforts mainly focused on processing raw data and passively presenting information to citizens and businesses. They were designed without the knowledge of how the presented data would be used, and hence the form and variety of data being presented was, in most cases, perceived to be of low value. Furthermore, many citizen groups may want to gain access to the original data captured by government agencies so they could analyze and interpret it on their own and draw inferences to support their goals (Janssen, Charalabidis, & Zuiderwijk, 2012). Also the industry and internet communities, given their advanced IT and managerial capabilities, could potentially be more innovative than public agencies in developing creative commercial and public welfare applications using the raw data available in the government repositories. Thus, over the past several years, public sector organizations have started efforts to leverage IT for making raw data and records available, mostly with machine-readable interfaces, so as to facilitate open innovation through open data initiatives (Zuiderwijk, & Janssen, 2014).

As governments at all levels move into the digital age, these initiatives of public sector organizations to promote and enable open innovation pose several challenges (Attard, Orlandi, Scerri & Auer, 2015; Pardo & Tayi, 2007). Foremost, agencies have to identify data sets that could be potentially valuable to user communities. This requires developing internal mechanisms that could be used to vet and process data sets by all relevant parties within the agency before release. Next, steps have to be taken to assure that the data sets being released are technically accurate as well as interpretable (Ham et. al, 2015). The data sets may have to be masked (in some instances) to ensure that privacy requirements are satisfied, while issues concerning legal liability are covered. For ongoing effectiveness of their open data initiatives, agencies may need to develop feedback mechanisms and measures to assess how the released data has been used by different stakeholders and the value, both economic and social, such use has generated (Zuiderwijk, & Janssen, 2014). Indeed, while the use of IT has helped to support the shift towards more open and collaborative innovation practices in the public sector, this also spurs a need for robust (theoretically-grounded, empirically validated) research on the challenges and effectiveness of its use as discussed below.

#### **5. Towards a research agenda**

In this section we describe directions for future research on open innovation in the public sector deriving from trends and gaps in the literature, including the papers that were submitted to this special issue. Specifically, our suggestions for future research in this area include conducting

domain-specific studies, examining the use of tools beyond social media, and expanding the existing set of research methods and theoretical foundations. However, the gaps could also indicate limited instances of domain-specific open innovation and limited use of other IT beyond social media for this purpose in practice, which should also be remedied.

### **5.1 Conducting domain-specific studies**

A large majority of studies of open innovation in the public sector broadly concern urban planning, or the improvement of public services in general (Lee et al., 2012; Bekkers et al., 2013), as also seen in the articles published in this special issue. Specifically, two of the seven papers in the special issue mentioned domains of innovation other than urban planning or public services in general, and there was a lack of salient domain-specific observations. However, open innovation in the public sector can also result in various benefits for other, specific domains. Examples of these domains that can benefit from open innovation and would be valuable to research in-depth include<sup>2</sup>:

- **Healthcare**

Public healthcare systems are facing huge challenges around the globe. With ageing societies and the increase in chronic diseases, the expenditure on healthcare is ballooning - as high as 17% of the GDP in the US<sup>3</sup>. Thus, there is a great need for innovation in public healthcare (Scheuer, 2008) to address these pressing challenges by making use of internal and external knowledge sources. However, open innovation in healthcare is subject to several unique barriers (Reinhardt, Bullinger, & Gurtner, 2015). First, complexity and information asymmetry in healthcare create barriers for incorporating new knowledge from outside the organization. Second, the fragmented nature of healthcare regulations e.g., the HIPAA Act, hinders inbound processes, but at the same time creates opportunities for outbound open innovation processes. Third, the rigid intellectual property protection culture in this sector impedes the external commercialization of ideas and knowledge. The cooperative development of new solutions faces further problems because of heterogeneous stakeholders in this domain. These issues indicate the need for more research regarding interdependencies between healthcare industry characteristics and open innovation methods. As an example, studies could analyze the problem of complexity and examine whether breaking up the problem or searching for experts is effective for addressing this issue. Additionally, in the IT space, studies could examine how to foster open innovation of smart healthcare services, such as tele-assistance and remote monitoring for aged patients.

- **Education**

Education is a crucial component of public services, which includes primary, secondary, and tertiary levels. In most countries, it is compulsory for children to attend school up to a certain age, and public education is supposed to ensure inclusivity of all student groups. In the long

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<sup>2</sup> These domains are also highlighted by the ITU Focus Group on Smart Sustainable Cities

<sup>3</sup> <http://www.bloomberg.com/news/articles/2016-09-29/u-s-health-care-system-ranks-as-one-of-the-least-efficient>

run, education may arguably be the most important public service of all, for adults as well as for children. With rapid globalization, a salient way for nations and economies to stay competitive is to develop and continue to build people's knowledge-based skills via education. This includes initial education as well as lifelong learning. Yet, though there is considerable spending on public education (e.g., \$11,843 per student annually on elementary and secondary education in the U.S.<sup>4</sup>), national education systems typically face challenges of lack of vision, good policy, and resources (Powell, 2013). With these constraints, there is considerable scope to innovate public education services by using IT tools<sup>5</sup>, but little systematic research in this area (Djellal, Gallouj, & Miles, 2013). This presents a significant opportunity for researchers to examine open innovation issues in public education e.g., the extent to which the challenges can be addressed using IT to enhance educational outcomes.

- Transportation

This domain offers great potential for open innovation efforts, as most citizens use some form of transportation to carry on their daily lives, yet face issues of congestion and travel delays. Given that an estimated 70% of the world's population will live in cities by 2050<sup>6</sup>, open innovation could contribute towards software products such as mobile apps that can work with individual citizen's wearable devices and assist them with real-time information about traffic conditions, social events, and location information about service delivery points (Kitchin, 2014). Interestingly, municipalities and cities under smart city initiatives can foster and support open innovation so that the same technology products can also collect and aggregate information about attendance at events, road and weather conditions, and traffic flow, and make available synthesized information to various transport agencies so as to improve traffic management and better handling of traffic emergencies. Furthermore, this domain allows for building partnerships between public and private sector entities to innovate products and practices that can enhance sustainable urbanization by enabling open innovations in intelligent transport systems. With these transformations taking place, there is significant scope for research on fostering open innovation in transportation and assessing its outcomes.

- Energy

With a growing emphasis on clean energy, utilities and governments all around the world are embracing technologies such as the "smart grid". This technology offers many benefits to energy utilities and consumers in the form of efficiency improvements in the electricity grid and in citizens' homes<sup>7</sup>. The success of these smart grids depends on the availability of more detailed data about system conditions from geographically dispersed devices and advanced metering infrastructure. The availability of large volumes and variety of data provides great opportunities for open innovation in this important sector of the economy (Arnold, & Barth

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<sup>4</sup> <https://data.oecd.org/eduresource/education-spending.htm#indicator-chart>

<sup>5</sup> <http://www.intel.ie/content/dam/www/public/us/en/documents/flyers/education-ict-benefits-infographic.pdf>

<sup>6</sup> <http://www.itu.int/en/ITU-T/focusgroups/ssc/Pages/default.aspx>

<sup>7</sup> <http://energy.gov/oe/services/technology-development/smart-grid>



2012). Some of the potential open innovation opportunities include leveraging this data and offering new software-based utility business models. For example, software products can be introduced to collect energy consumption data from smart meters and bundle the information in different ways to suit both citizens and local municipalities' or regional agency's needs. While citizens may need information about their daily, weekly, or monthly usage analysed according to categories, such as nature and time of usage (e.g., by appliances, lighting, morning, evening), municipalities may want the information aggregated at the community, town, or residential, and industrial levels. These products could also offer usage suggestions to individual citizens based on their stated preferences (price, time of use) and values (lower environmental impact) in consuming energy. With the considerable potential for open innovation in this domain, there is correspondingly a need for research to examine and assess the related phenomena.

- Elections and e-participation

In the domain of elections, political parties can use external sources (e.g., citizen networks) to obtain knowledge of issues their election campaign should target. In order to account for the opinions of potential voters, the views of citizens regarding particular topics can be gathered by, for instance, mining social media and using sentiment analysis (Stieglitz, & Dang-Xuan, 2013). However, a risk here is the misinterpretation of social media data. Therefore, additional methods may be used, such as face-to-face meetings with interest groups and trade unions that promote the interests of their members, so that they can help with the interpretation and validation of the findings from social media analysis. Additionally, researchers have been examining various forms of e-participation for policy formulation and citizen feedback (e.g., Sharma, Kankanhalli, & Taher, 2013; Phang, Kankanhalli, & Huang, 2014; Phang, Kankanhalli, & Tan, 2015), from which theories and methods could be extended to research open innovation in e-participation and elections.

- Safety and justice

Open innovation in the domain of safety and justice includes the use of social sensors for surveillance. By integrating a large variety of open and closed datasets derived from sensors and other real-time data streams, insights into safety needs of particular areas can be obtained. Policy makers and agencies may use this data to determine which areas should receive priority in surveillance activities (Elmaghraby, & Losavio, 2014). Another example of open innovation in the domain of safety and justice concerns providing information on how the criminal justice chain works. As it is often unclear to citizens (including victims of crimes) how governmental organizations take decisions regarding prosecution and punishment, this lack of information was found to reduce the trust of citizens in government. Public benefit and value can be created through online intermediaries that provide citizens with knowledge of the criminal justice system and at the same time evaluate their knowledge of the system and collect their opinions regarding processes and decisions made in this area. Academics can also be invited to give their opinion of intended changes to the criminal justice system. The feedback gathered from citizens and academics (via the intermediary) can

subsequently be reported back to governmental agencies. With most research in this area being at the multi-domain level (e.g., Mergel & Desouza, 2013), there is significant scope for domain-specific research on open innovation in public safety and justice.

## **5.2 Examining tools beyond social media**

So far, much of the prior research, as also seen in the articles submitted to this special issue, about IT for open innovation in the public sector has focused on social media tools. Specifically, two of the accepted papers in this issue examined open innovation going beyond these tools. However, in other realms, crowds are becoming the partner of choice in open innovation (Boudreau & Lakhani, 2013). In the private sector, many leading firms including Apple have leveraged the power of crowds to enhance their products and services. Similarly, Wikipedia, a web-based free content encyclopaedia written collaboratively by a crowd of volunteers, is a classic example of open innovation in the non-profit sector. Using crowds of citizens to facilitate open innovation is an attractive mechanism available for government agencies within the health, transportation, city planning and social services sectors, among others. As crowdsourcing enters the mainstream, it is imperative that researchers conduct studies about the efficacy of open innovation engendered by crowds in the public sector, extending existing research on this topic in the private sector (e.g., Ye, & Kankanhalli, 2015). A possible area of study would be to explore how local governments could utilize crowd contests, for example, in designing services for the aged. Other studies could undertake rigorous empirical testing to examine which forms of crowd based mechanisms work better for open innovation in the public sector. Further, going beyond crowd contests, other technological mechanisms for open innovation such as open data platforms (Yang, & Kankanhalli, 2013; Zuiderwijk, & Janssen, 2014) e.g., for building analytics solutions, and delivering services via smartphones, also warrant further research.

## **5.3 Expanding the set of methods and theories**

Based on the sample of articles we received for the special issue and a brief overview of the literature on open innovation in the public sector (e.g., Lee et al., 2012; Mergel, & Desouza, et al., 2013), most of the current studies appear to be qualitative (through case interviews) - specifically, five of the accepted papers followed a case study approach - and often lack a theoretical foundation. This is appropriate when a field is nascent, as exploratory case studies help to gain initial understanding of the issues and salient phenomena in the field. However, as our knowledge increases, this calls for expanding the research methods to other (e.g., surveys and econometrics) techniques that can test explanatory and predictive models in this area. Theoretically, too, future research could go beyond employing technology adoption theories or no theory - as was done in two studies in this special issue. Indeed, there is potential to make use of public administration theories, such as for explaining citizen participation, and related organizational theories, such as for explaining user innovation, absorptive capacity, crowdsourcing, and knowledge brokering, and examine how they could be extended to explain open innovation phenomena in the public sector. This will help to build a robust, theoretically-grounded and empirically-validated body of literature on this topic.

## **6. Overview of the special issue papers**

This special issue covers various topics related to open innovation in the public sector. Out of the twenty-one submitted papers, seven papers were selected for this special issue. All the papers underwent a rigorous double-blind review process and were evaluated by at least two expert reviewers. Below we briefly describe the contents of each accepted paper.

The article on living labs for open innovation in the public sector by Gascó proposes living labs as environments to support public open innovation processes. As stated in the paper, living labs provide a collaborative platform for research, development, and experimentation in real-life contexts. This article investigates how living labs may function as public open innovation intermediaries, what are the observable public innovation outcomes of living labs, and what are the main challenges encountered by living labs as open innovation intermediaries. To attain these research objectives, the author conducted fourteen semi-structured interviews and a focus group. Two Spanish living labs were examined, namely 1) Citilab in the city of Cornellà, and 2) the network of fab athenaeums (public fab labs) in the city of Barcelona. The author draws three main conclusions from the analysis. First, she states that living labs can function as innovation intermediaries by enabling governmental organizations to meet private sector organizations. Second, the specific innovation outcomes are viewed as less important than implementing an open innovation perspective. Third, the main issues that are encountered by living labs as open innovation intermediaries concern scalability and sustainability. This paper contributes by providing a better understanding of the role of living labs as intermediaries of public open innovation.

The paper on promoting open innovation in the public sector through social media monitoring by Loukis et al. builds on theoretical foundations from the political and management sciences to develop a multi-perspective evaluation framework. The framework comprises three perspectives, namely a political perspective (based on the 'wicked' social problems theory from the political sciences), a crowdsourcing perspective (based on previous management sciences research on crowdsourcing) and a diffusion perspective (based on Roger's diffusion of innovation theory from the management sciences). Furthermore, the authors apply the framework to evaluate a method for governmental organizations to monitor social media, such as political blogs, news websites, Facebook and Twitter. The content from these social media are acquired and processed to extract external knowledge regarding specific domains of government activity or public policies of interest, as this can promote and support open innovation in the public sector. The evaluation reveals that the method has various strengths, such as enabling the extraction of knowledge concerning society's level of interest for and discussion of a certain domain or policy, attitudes and sentiments of the society, issues posed by citizens, and proposals for solving relevant problems or improving policies. Yet the method also has weaknesses and risks, such as reliability and quality issues, the extent of representativeness of the citizens' groups who generate the social media content, and the potential to misuse outcomes of social media

monitoring. The authors describe interventions to address the weaknesses and further improve the method. They conclude that their method can be useful for the facilitation, promotion, and support of open policy innovation.

The paper by Reddick et al. develops a framework for facilitating organizational learning through social media text analytics to enhance the quality of citizen services. The framework integrates double-loop learning theory with existing models of public e-participation, and is applied towards a case study of citizen-government interactions on a local government department's Facebook page on recycling in San Antonio, Texas. The study surmises that the missed double-loop learning opportunity in this case occurred because the Facebook posts were mainly used to advocate the government agenda of educating citizens to change their recycling behaviours, without efforts to understand citizens' views on the matter. Suggestions are offered to promote government's double-loop learning through social media to enhance public service quality.

The paper by Zhang et al. notes that the popularity of social media has provided government agencies, including those in developing countries such as China, with new opportunities and challenges for implementing open innovation initiatives. The paper presents the case of the official document exchange via microblogging (ODEM) system of the Haining Bureau of Justice as an example of government open innovation efforts in the social media context. The authors apply the technology-organization-environment (TOE) framework to the ODEM case to explore the factors that drive open innovation in this case. The findings indicate that the support of senior management, the access to and competence of IT personnel, and the regional socio-economic environment are key determinants of the adoption of open innovation in this case.

The paper by Konsti-Lasko, addresses two research questions that pertain to the role of social media in fostering open innovation. First, how can citizen online communities support open innovation initiatives in the public sector? Second, what kinds of contributions are produced through social media platforms? These questions are examined through an experimental research set-up, by analyzing interactions and contributions made in a neighborhood development-oriented Facebook group. This study contributes to research on open innovation in the public sector by highlighting the networked nature of citizen participation and emphasizing citizens' capacity for making meaningful contributions.

The paper by Baka describes the process of co-creating an Open Platform at the local government level. The "open" mode of thinking, acting, and being has been associated with liberating, participatory, and collaborative arrangements. This has led to a redefinition of how research, science, innovation, and citizenship are to be conceived. In an era where much is said about the 'open society' and 'open innovation', looking at the interplay between involvement, technology and social good acquires greater importance and interest. Using an action research

approach, the author examines how actors have created an open technology platform at the local government level in a town in Zambia. The focus here is on how the different groups of local people have co-created the technology through multiple negotiations, organizational forms, and institutional arrangements. Being theoretically inspired by the 'technology enactment framework', the paper proposes an approach for framing the design of participatory technology projects at the local governance level, with implications for both theory and practice.

Last, the paper by Gagliardi et.al. investigates how open data together with simple and standardized elaborations and innovative visualization techniques can be used to provide new and updated services to citizens and communities -- free and readily available services based on the wealth of information 'owned' by local governments. Adopting a design science methodology the authors develop and test a collaborative ICT-based tool called UrbanSense. It is used to highlight how systemic connections between citizens and city-government may be devised. Specifically, the focus is on feedforwarding of open data integrated with basic elaborations and visualizations as a means for the local government to create new and open services for citizens and communities. The use of these services prompts citizens to provide feedback on new information in real-time to the city government. These interactions may be used to foster an open innovation ecosystem.

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