

## Digital government and public management research: finding the crossroads

J. Ramon Gil-Garcia, Sharon S. Dawes & Theresa A. Pardo

To cite this article: J. Ramon Gil-Garcia, Sharon S. Dawes & Theresa A. Pardo (2018) Digital government and public management research: finding the crossroads, Public Management Review, 20:5, 633-646, DOI: [10.1080/14719037.2017.1327181](https://doi.org/10.1080/14719037.2017.1327181)

To link to this article: <https://doi.org/10.1080/14719037.2017.1327181>



Published online: 25 May 2017.



Submit your article to this journal [↗](#)



Article views: 21917



View related articles [↗](#)



View Crossmark data [↗](#)



Citing articles: 10 View citing articles [↗](#)



# Digital government and public management research: finding the crossroads

J. Ramon Gil-Garcia<sup>a,b</sup>, Sharon S. Dawes<sup>a</sup> and Theresa A. Pardo<sup>a</sup>

<sup>a</sup>Rockefeller College of Public Affairs and Policy & Center for Technology in Government, University at Albany, State University of New York, USA; <sup>b</sup>Public Administration Division, Centro de Investigación y Docencia Económicas, Mexico

## ABSTRACT

Information and information technologies have become ubiquitous in the public sector and it is difficult to think of a public problem or government service that does not involve them in some substantial way. Public management (PM) research now incorporates the effects of the availability and quality of data as well as the technologies used in the public sector. From a PM perspective, digital government (DG) could be considered an essential aspect of innovation, co-production, transparency, and the generation of public value. However, studies that attempt to understand the role that DG research plays in PM theory and practice are scarce. As a research field, DG emerged from multiple disciplines, including public administration, information science, management information systems, computer science, communication, and political science. There have been numerous efforts in the last decade to delineate this emergent academic community by assessing the growing body of research represented by hundreds of new peer-reviewed publications every year. This paper reviews these prior studies about the DG community, along with a systematic review of recent articles in top public administration journals from the United States and Europe, to begin to identify and compare key characteristics of these academic communities, including their core researchers, theories, topics, and methods. We argue that their similarities and differences present opportunities for more dialogue between DG and PM scholars that could produce synergies to enhance the production and dissemination of knowledge, yielding greater influence on practice.

**KEYWORDS** Digital government; public management; public administration; government information technology; research; information technologies

## 1. Introduction

It is hard to imagine any government function or governance process that does not involve extensive use of information and technology. The use of information and communication technologies (ICT) in government, and the explosion of digital information throughout society, offers the possibility of a more efficient, transparent, and effective government. At the same time, these trends challenge traditional notions of administration, management, organization, accountability, and engagement.

Today, at all levels and in all branches of government we find tools, applications, and emergent technologies being applied to the needs of citizens, service users, public

servants, and political leaders. Mobile applications, open data, social media, technical and organizational networks, the Internet of things, sensors, data analytics, and more are embedded in the working environment of government. Collectively, we have come to label this set of developments as ‘digital government,’ a concept that has broadened in scope from an early focus on the use of ICT for government administration to the more recent notion that information and technology influence administration, management, and governance. Digital government (DG) as a phenomenon involves new styles of leadership, new decision-making processes, different ways of organizing and delivering services, and new concepts of citizenship. Our view of DG aligns with UNESCO’s definition of e-governance: ‘*The public sector’s use of information and communication technologies (ICTs) with the aim of improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent, and effective.*’ (UNESCO 2011)

As a domain of study, DG has its roots in computer science, political science, information science, and public administration. Accordingly, it reflects a variety of perspectives, methodologies, and themes that draw on or cross over these traditional scholarly disciplines. For example, Moon, Lee, and Roh (2012) argue that DG is part of the discipline of public administration rather than a coherent area of study in itself. From their perspective, research on DG has evolved as a sub-area of public administration. By contrast, Dawes (2009) argues that DG is inherently multidisciplinary and reflects the convergence of essential questions about governance, individual rights, technical developments, and information collection, use, and dissemination. This dynamic environment demands a more holistic and flexible perspective about the prospects for government and governance in the digital age. Scholl (2006) has argued strongly that DG, while not a discipline in the traditional sense, is a distinct field of study with a multidisciplinary outlook on the challenges of the information society.

Likewise, many scholarly efforts have sought to characterize the development and trajectory of DG research (Erman and Todorovski 2009; Grönlund, Ake y Andersson, Annika 2006; Heeks and Bailur 2007; Meijer and Bekkers 2015; Rodríguez Bolívar, Alcaide Muñoz, and López Hernández 2014; Scholl et al. 2009; 2014; 2016; Wahid et al. 2012; Wirtz and Daiser 2016; Yildiz 2007). Some identified and characterized the core community of DG scholars, including their academic backgrounds, expertise, regional location, research foci, and productivity (Scholl et al. 2009). Others addressed the theories, frameworks, philosophies, concepts, and variables that DG scholars use in their research (e.g. Heeks and Bailur 2007). Still, others have examined the research methods and data employed in DG research (Grönlund, Ake y Andersson, Annika 2006; Wahid et al. 2012). Studies have also examined the influence of DG development on public sector policies and practices (e.g. Dawes, 2013; Gil-Garcia and Pardo 2005; Gil-Garcia, Pardo, and Nam 2015). This last line of work considers the practical impact of government’s adoption of a new technology or new types or uses of data as well as the extent to which DG research findings are reflected in practical guidance for public managers.

DG scholars have also identified the field’s main themes and topics of investigation, which include government transformation, digital democracy, citizen engagement, access to information, and improved public services, among others (Scholl et al. 2014). They have also identified some of the major unanswered

questions still to be investigated (Yildiz 2013), including how to better connect DG studies with mainstream public administration research and how to better measure and evaluate performance and results. These themes have strong theoretical and practical ties to public administration in general and public management (PM) in particular. For example, DG scholars Gil-Garcia and Luna-Reyes (2006) and PM scholars Moon, Lee, and Roh (2012) both used Rosenbloom's (1983, 1998) framework to categorize studies based on their focus of attention: managerial, political, or legal. The managerial approach is related to values such as efficiency, effectiveness, and economy; the political approach is concerned with values of representativeness and accountability; and the legal approach with values of equity, due process, and individual rights.

Clearly, DG research addresses many management values as it explores the implications of technology adoption for service delivery systems, cost-effectiveness, human resources, organizational structures, processes, and performance. The political approach to DG research addresses the effects of information and technology on transparency, accountability, and citizen and community engagement. DG studies focused on legal aspects address such issues as privacy, access to information, and human rights, among others. Combining these various considerations, Dawes and Helbig (2015) offer a conceptual model for understanding DG as a dynamic phenomenon in which policies, management and organization, technology, and data all interact within a given social, political, and economic context.

DG and PM also share strong ties to practice. Hardy and Williams (2011) argue that improving the quality and impact of DG research requires greater consideration of complex governmental contexts and more interdisciplinary and collaborative research that informs not only theory but also policy and practice. To this end, Dawes (2009), like Ospina and Dodge (2005) and others in PM, argues that the relationship between research and practice can be mutually beneficial, if researchers apply their skills, theories, and methods to problems identified by experienced and knowledgeable public managers – especially when they work in active collaboration.

Given these points of connection, we believe more dialogue between PM and DG scholars would benefit both domains. This special issue represents an opportunity to explore how these closely related fields might benefit from greater familiarity and closer collaboration.

This article is organized in five sections, including this brief introduction. [Section 2](#) describes the methodological approach we used for our review of top PM journals and previous studies of published DG research. [Section 3](#) presents our main findings and discusses them in relation to prior findings about the full multidisciplinary DG community. This is done by identifying the core authors, topics, theories, methods, and findings. The description of the overall DG community is based on reviews of published research without disciplinary boundaries and includes authors from multiple disciplines. While it is clear that a few DG scholars are already becoming important links with the PM discipline, there are also many missed opportunities for synergies and mutual learning. [Section 4](#) summarizes the articles included in this special issue as illustrative examples of efforts to integrate theories and concepts from DG and PM. We believe they are good starting points for discussion and for other similar efforts in the future. Finally, [section 5](#) provides some concluding remarks and suggests areas for future research.

## 2. Methodology

This article relies on reviews of research published in both DG and PM outlets. First, we considered recent research published in eight public administration journals that emphasize PM. The journals shown in [Table 1](#) were selected for their high rankings in the field to assure a sample of high-quality articles. All articles in these eight journals from winter 2010 to spring 2016 were reviewed. Those related to the use of information and technology in the public sector were selected based on the title, abstract, and keywords and then downloaded from the journal web pages. Only research papers were included. There was no particular trend in the number of articles published each year, ranging from a low of two in 2010 to 14 each in 2011 and 2012. Three outlets account for most of the published papers: *The American Review of Public Administration* (25%), *Public Administration Review* (19%), and *Public Management Review* (19%). All publishing houses (Wiley Group, Sage Publications, Routledge, Oxford Press, and Taylor and Francis) are based in either the United States or the United Kingdom. The largest number of articles was published in journals operated by Wiley (37%) or Sage (25%).

Second, we systematically reviewed prior studies of published DG research that attempt to understand and characterize not only the DG academic community but also the scope of DG as a field of study in terms of its theories, methodologies, topics, and practical implications. Some of these studies are based on reviews of papers from specialized conferences, specific journals, or a comprehensive reference library of DG publications<sup>1</sup> compiled by Professor Jochen Scholl (2009, 2014, 2016). Finally, we reviewed titles and abstracts of recent articles published in specialized DG journals such as *Government Information Quarterly*, *Information Polity*, and the *International Journal of Electronic Government Research*. The purpose of this review was to identify the most frequent topics addressed in recent studies. In general, the sources of information about DG research use a larger body of work over a longer time period and are not strictly comparable with our review of recent publications in the PM journals. Both sources present useful information, however, about the make-up of the communities, their areas of interest, their general approach to research, and their links to the world of practice. Thus, they serve as a reasonable starting point for understanding similarities and differences in different publication outlets.

Using these sources of data, we explored five interrelated questions: (1) To what extent do scholars in the two domains overlap? (2) What are the main topics studied and what do they have in common across the two domains? (3) What types of research methods are used and what kinds of data are employed? (4) To what extent

**Table 1.** Public management journals selected for the study (winter 2010 to spring 2016).

Journal	No. of papers	Per cent
Governance: An International journal of policy, Administration and Institutions	4	7%
International public management journal	5	8%
Journal of policy analysis and management	3	5%
Journal of public administration and theory	6	10%
Public administration	4	7%
Public administration review	11	19%
Public management review	11	19%
The American review of public administration	15	25%
Total	59	100%

do the two bodies of work present practical and policy recommendations in addition to research findings? (5) Where are the opportunities for collaboration and synergy across the two communities?

### 3. Similarities and differences in digital government and public management research

This section illustrates some of the differences and similarities between DG research published in PM outlets and DG research published in other peer-reviewed outlets. The section follows the order of our questions above and provides brief comparisons of the activities of the DG and PM research communities to begin to explore if and how the two fields are related, aligned, or, ideally, interrelated.

#### 3.1. Scholarly communities

Scholl (2015) argues that the study domain of DG has accumulated a relatively large body of knowledge and has formed a well-structured research community, which produces a steady flow of research output. He has been studying the DG research community for a number of years, including its core scholars, their academic backgrounds, the most common outlets in the field, which research methods they use in their studies, and how their publications have changed over time (Scholl et al. 2009, 2014, 2016). In 2009, Scholl identified 55 scholars as the core of the DG research community (Scholl et al. 2009). They were mainly based in Europe and North America, with some representation from Asia in recent years (Scholl et al. 2014). Similarly, Erman and Todorovski (2009) identified a list of the most cited authors in the field by using social network analysis, but their scope was limited to a single international conference. These studies of the DG community differed in their use of data; some authors analysed only journals, others included specific academic conferences, and Scholl (2009, 2014, 2016) analysed all peer-reviewed publications, irrespective of discipline or type of outlet.

In general, the DG research community has grown dramatically in the past 15 years and has a clear core of about 60 senior scholars with at least 20 peer-reviewed publications each in diverse journal and conference outlets. This group also exhibits a diverse disciplinary background that includes computer science, information science, management, public administration, and political science. The DG community is geographically dispersed, although the largest numbers of authors come from Europe, followed by North America and Asia. DG scholarship is commonly authored by multiple researchers, often with two, three, or more authors. Single-author publications are in the minority. A decade ago, Grönlund, Ake y Andersson, Annika (2006) showed that very few of the papers involve authors from more than one institution, although it is more common to have authors from more than one discipline.

By contrast, PM researchers interested in DG topics show a different pattern. Our sample of 59 PM articles involved 125 authors. Among those authors, 92 of them authored only one paper, 11 authored two papers, and only three authors had three or more published papers. From this data, it would seem there is no core community of PM scholars who are publishing about the use of information and technology in government in the top ranking PM journals. However, two authors of papers in our

sample are also among the top 20 most influential DG researchers identified in Scholl's (2016) latest study. These two authors have been conducting research and publishing about DG for many years, but their publications not only appear in PM outlets but also in journals and peer-reviewed conferences from other disciplines. Therefore, they have many more publications in outlets outside PM and more publications in prior years not covered in this review. We also looked at the number of authors for each article and their background disciplines. Here, there is some similarity with DG researchers. Of the total of 59 articles, three-quarters were co-authored. However, the most common collaborations only had two authors. Authors tend to be concentrated in the United States, followed by Europe and with some representation from Asia, mainly Korea. However, very few papers are collaborations between authors from different countries. In addition, in two-thirds of the papers, the authors came from the same academic background; they tended to be part of the same school and discipline.

The DG and PM scholarly communities vary across several dimensions: geographic distribution, the existence of a core set of scholars, and authorship patterns. While more DG authors are based in Europe than other parts of the world, more PM authors are based in the United States. Analysis of the DG scholarly community provides strong evidence for a core set of scholars which is not evident in the PM scholarly community that is publishing on DG topics. Authorship patterns are also different. While both communities tend towards multi-author papers with authors coming from the same institution, DG papers tend to have more authors and authors from different disciplines, while PM papers tend towards just two authors, typically from the same discipline.

### **3.2. Themes, topics, and specific technologies**

Several of the DG review papers identified the main topics and themes studied by the DG research community. Erman and Todorovski (2009) used social network analysis to identify the most influential themes. They found (1) state-of-the-art DG research, (2) integration of electronic services (e-services) in public administrations, (3) digital divide, (4) factors of success and failure of DG projects, and (5) roadmaps for future research. Scholl et al. (2014) relied on manuscript titles and keywords to obtain a view of topical directions and scholarly interests in the DG domain. His findings show that the research topics in electronic government between 2009 and 2013 mainly focused on electronic and transformational government, ICTs, public participation, electronic public services, and the digital divide. Our own review of titles and abstracts of articles published in the top DG journals in the last 3 years reveals strong recent interest in social media, open government, open data, e-services, and smart cities.

These themes and topics could include a wide spectrum of DG applications and characteristics, but such comprehensiveness makes it difficult to summarize the essential elements (Gil-Garcia 2012). Gil-Garcia and Luna-Reyes (2006) respond to this difficulty by categorizing the contributions from different authors into four main categories (Gil-Garcia and Luna-Reyes 2006): e-services; electronic management (e-management); electronic democracy (e-democracy); and electronic policy (e-policy). Using these categories, we classified all of the papers in our review of the PM literature (see Table 2). Almost half of the papers (42%) focus on themes related to

**Table 2.** Classification of PM articles into DG categories.

Main category	Percentage	Elements
E-democracy	42%	Participation, transparency, accountability
E-management	27%	Management, planning, personnel
E-services	25%	Services
E-policy	5%	Policies, governance
Total	100%	

e-democracy. The most frequent elements were participation, transparency, and accountability. This category included topics such as citizen engagement, fiscal transparency, social media, open government and open data, and budget transparency. The e-management category was the second most frequent (27%), with elements like planning and personnel issues. In this category, we found research on such topics as organizational change with the use of ICT, e-adoption, innovation, emergency response, discretion, and trust. The third most common category was e-services (25%). These papers refer to specific topics such as service delivery, accessibility, government websites, and wireless broadband. Finally, only three papers (5%) fell under the category of e-policy with research themes related to technology adoption and regulation.

A number of DG-related concepts appear frequently in our review of the PM literature such as IT adoption, e-participation, trust, transparency, citizen participation, use of ICT, and social media. Most of the PM papers referred to the content and use of websites or government portals and the information included in these portals. Ten papers addressed Web 2.0 technologies, primarily related to social media use such as Twitter. Ten others focused on a specific technology or device such as mobile, internet, call centres, open architecture, or specific software tools or devices. A few papers referred to intranets, GIS technology, and wireless broadband.

A topical comparison across the PM and DG scholarly communities begins to illustrate common interests across the two domains. For example, many topics found in the DG reviews – participation, open government and open data, and the digital divide – map quite easily to the area of e-democracy, the category with the highest number of PM publications. Further, DG scholarship in areas such as DG success factors and smart cities maps well to the e-management category, the second highest among the PM papers. Finally, both communities appear to be investing in research on the broad area of e-services, and in the design and impact of particular technologies and tools such as social media.

### **3.3. Research methods and data sources**

The third aspect of DG research we reviewed is the methods and data used in the published papers. Early in the development of DG research, normative statements and literature reviews dominated, but there has been a reduction in purely conceptual or descriptive research (Moon, Lee, and Roh 2012; West 2003; Yildiz 2007). Accordingly, studies have continuously increased in methodological diversity and theoretical rigor (Moon, Lee, and Roh 2012). Case studies are widely used as a research methodology to examine particular aspects of ICT and information use in government and to better understand complexity and offer practical and public policy implications (Moon, Lee, and Roh 2012). In the context of developing



**Table 3.** Comparison of methodological approaches.

DG research (Scholl et al. 2009)	Methodology	PM research (Current study)
45.50%	Quantitative	69%
9%	Qualitative	12%
45.50%	Mixed	8%
0%	Literature review	10%

countries, Wahid et al. (2012) identified the case study as the most employed methodology and also found other methods such as surveys, experiments, and action research.

In contrast, PM research on DG topics has used primarily quantitative methods (see Table 3). First, we looked for an explicit section that describes the paper's methods, data, and research questions. We found 15 articles did not describe their methodology in a clear manner, which represents around 25% of the sample. For the articles that did describe their methods, we followed Scholl's et al. (2009) definition of quantitative and qualitative methods and, as mentioned above, found that the majority of the studies (69%) used quantitative methods. The quantitative tools most employed are descriptive statistics, different types of regression models, structural equation models, citation analysis, and factor analysis. Twelve per cent of the studies used qualitative methods such as case studies and content analysis. In addition, six papers were literature reviews which we classified separately since they do not use empirical data. Very few papers used a mixed-method strategy.

We also considered the type of data collection methods. Heeks and Bailur (2007) distinguished between the studies that relied on primary or secondary data and identified whether those studies used multiple methods versus quantitative or qualitative methods exclusively. They write, 'Of classifiable papers, just under two-thirds used primary data (though this included papers where practitioners reflected on their own experiences), and just over one-third used only secondary data' (Heeks and Bailur 2007, 256). More recently, Wirtz and Daiser (2016) identified specific quantitative and qualitative tools such as structural equation modelling, ANOVA, regression, and confirmatory factor analysis, among others. Likewise, Scholl et al. (2009) analysed which general methods the core researchers preferred. Although he found scholars draw from a wide range of methods (from qualitative studies based on grounded theory at one end of the continuum to purely quantitative methods like algorithmic studies and simulations at the other end), he simply distinguished between 'qualitative' and 'quantitative' studies to gain an overall perspective on the field.

Of the 59 PM articles in our review, 11 used primary data (19%), 25 used secondary data (42%), and 17 used both (29%). In six (10%), it was unclear whether the data were primary or secondary. Primary sources included online surveys and questionnaires, in-depth interviews, web and social media content analysis, and document analysis. Most secondary data came from national surveys, online records and databases, reports, and online media and websites. Although no comparable information is available about previous DG research overall, for our sample of PM papers we also studied the geographic focus and level of government addressed by each paper. Almost half focused on local governments (49%), with national-level studies accounting for one-third (31%) and regional or state-level studies making up

only 12%. In terms of geographical regions, 39% of the papers focused on the United States, 20% on Europe (including Spain, Germany, Italy, and the Netherlands), and 14% on countries in Asia (namely, Korea and China). One paper focused on Oceania (New Zealand), one on Latin America (Brazil), and none on Africa. We found seven articles (12% of the total) focused on a group of countries from different continents, which we labelled international studies. A final 7% were conceptual papers without a regional or national focus.

As noted above, DG is a rapidly growing and evolving area of research. A notable feature of the evolution of DG research is a reduction in the proportion of conceptual and descriptive work with a shift towards papers with more methodological and theoretical rigor (Moon, Lee, and Roh 2012). The early years of DG research included heavy reliance on case studies as a tool to begin unearthing the complexity of the phenomenon and to build theory. This balance is shifting away from case studies towards a pattern that is more like that generally seen in PM, where close to 50% of the papers analysed use quantitative methods either exclusively or in combination with qualitative work. In addition, the use of primary data is more common in DG research than in our sample of PM articles.

### **3.4. Practical and policy recommendations**

As in other fields strongly related to practice, DG scholars seek to provide practical recommendations derived from sound research (Fountain 2003). Dawes (2013) argues for a connection between practice and knowledge where researchers use academic theories, standards, and methods to serve the real needs of government as expressed by government professionals in partnership projects. The profound know-how of government organizations and public policymakers should enhance and frame research questions, possibilities, and the presentation of results (Dawes, 2013). Gil-Garcia and Pardo (2005) also argue that practical tools and guides should be grounded in the latest research and practice to best serve both groups. Understanding and reducing risk in DG initiatives is a high priority for both researchers and practitioners. Therefore, we would expect most DG papers to provide practical implications and recommendations. Early research on DG focused on the potential for ICTs to help governments become more efficient and reduce their costs (Ho 2002; Moon, Lee, and Roh 2012; Rodríguez Bolívar, Alcaide Muñóz, and López Hernández 2014). However, efficiency is only one potential impact that deserves investigation. More recent work addresses factors underlying effectiveness such as leadership and trust as well as social and political impacts like transparency and participation. Previous reviews of DG research analysed papers in terms of whether they provide practical recommendations. For instance, in 2007 Heeks and Bailur found that less than half the articles they reviewed had any specific practical recommendations. Among those articles that did provide practical recommendations, three-quarters gave a single sentence or, at best, a single paragraph of recommendations. In recent years, there has been greater attention to practical implications, but it continues to need more emphasis in scholarship. Similarly, in our review of the PM literature, we found 53% of the articles included some practical recommendations in their final comments or in their findings and results sections. The nature and extent of these recommendations should be studied with more detail in the near future.

#### 4. Digital government and public management research in action: some illustrative examples

The articles included in this special issue illustrate the value of combining DG and PM research. We argue that these fields jointly offer a powerful perspective and integrating concepts from the two can help us to better understand complex social problems and provide empirically grounded implications and practical recommendations. One article, for instance, argues that trustworthiness is a significant concept in DG, but has its origin in public administration. Another presents a framework about collaborative governance, but explicitly integrates the role of technology and its interplay with management, collaboration, performance, and the context in which these dynamics are embedded. A third shows how government collaboration with private organizations for DG projects negatively moderates the effect of resources and positively moderates the effect of processes on public value creation. Another paper illustrates how the outcomes of public sector reforms are shaped not only by legislative forces and ubiquitous technological enablement but also, and more prominently, by environmental dynamics. The next article studies the barriers to the adoption of DG, describing how online open innovation platforms seek to increase government innovation by posting public sector problem statements, then collecting and evaluating ideas submitted by citizens. Another article focuses on environmental hazards and how precision governance reflects an administrative capacity in which policy decisions are enhanced by the use of information about individual and collective preferences. The final article focuses on the connection between research and practice by analysing how current public affairs graduate programs prepare students for governing in the digital age and offers suggestions for how to better incorporate information management, use, and technology into public affairs curricula in the United States.

In their article entitled ‘Trustworthiness of digital government services: deriving a comprehensive theory through interpretive structural modelling’, Janssen et al. describe the origins of the concept of trustworthiness in public administration and how it has become a very important concept in DG research. They highlight the influence of trust on the relationship between citizens and governments. The article develops a theory to explain the factors affecting citizens’ perceptions of e-government trustworthiness, based on a comprehensive review of the public administration and information systems literature. They highlight 20 pertinent variables, identifying and categorizing their interrelationships by employing interpretive structural modelling. The findings reveal that current conceptualizations of DG trustworthiness take a too-narrow view. The findings can help government policymakers better understand the interrelated factors associated with trustworthiness in the context of DG services and implement them in effective strategic planning.

Likewise, Chen and Lee integrate insights from collaborative governance, network management, and cross-boundary information sharing to develop a framework that outlines the interplay among context, management, collaborative dynamics, technology, and performance. Their article, ‘Collaborative data networks for public service: governance, management, and performance’, aims to advance the theory and practice of managing collaborative data networks for information and decision support services in over 400 U.S. metropolitan areas. This study applies the framework to conduct an exploratory in-depth case study of a metropolitan transportation data

network to examine this interplay. The findings suggest ways to improve the performance of collaborative data networks.

Also related to inter-organizational networks and collaboration, Picazo-Vela et al. argue that collaborative approaches to PM are generally known to represent sources of public value. However, certain theoretical and empirical gaps in understanding this process of value creation persist. Their article, 'Value of inter-organizational collaboration in digital government projects', adopts a resource-based lens to analyse how public and private collaborations moderate relations among resources, processes, and the creation of public value. Their results show that collaboration with private organizations negatively moderates the effect of resources on public value creation and positively moderates the effect of processes on public value creation. Collaboration within the public sector positively moderates the effect of resources, but not the effect of processes.

Castelnovo and Sorrentino's article, 'The digital government imperative: a context-aware perspective', applies a 'context-aware' research approach to explore Italy's DG trajectory, using the ICT-enabled program that introduced the One-Stop Business Shop to exemplify its analytical potential. The interpretive lens captures the political, institutional, and external forces at play to illustrate how the outcomes of public sector reforms are shaped not by legislative strong-arming and ubiquitous technological enablement, but by the environmental dynamics. To demonstrate the central role of contextual factors in achieving the desired change, the study conducts a qualitative exploratory analysis that opens doors left mostly closed by the deterministic view of the mainstream literature on digital reform.

Studying the barriers to adoption of DG, Mergel describes how online open innovation platforms like Challenge.gov are used to post public-sector problem statements, then collect and evaluate ideas submitted by citizens with the goal of increasing government innovation. Her article, 'Open innovation in the public sector: drivers and barriers for the adoption of Challenge.gov', uses quantitative data extracted from contests posted to Challenge.gov and qualitative interviews with 36 public managers in 14 federal departments. The article contributes to the discovery and analysis of intra-, inter-, and extra-organizational factors that drive or hinder the implementation of open innovation in the public sector. The analysis shows that system-inherent barriers hinder public sector organizations from adopting this procedural and technological innovation. When the mandate of the innovation policy aligns with the mission of the organization, however, it opens opportunities for change in innovation acquisition and standard operating procedures.

The next article focuses on environmental hazards and how precision governance represents an administrative capacity in which policy decisions are enhanced with information about individual and collective preferences and contexts. Hondula et al. introduce the prospects for precision governance of natural hazards through the use of both big and individual data technologies, describing what is enabled and what concerns arise with their use. The article, 'Toward precision governance: infusing data into public management of environmental hazards', grounds the authors' perspective with a topical focus on mitigating the health risks of high temperatures in the chronically hot setting of Phoenix, Arizona in the United States. Their study, which examines individually experienced temperature data, provides compelling evidence that the transition towards data-driven precision governance will enhance hazard preparedness and response efforts.

Hu closes this special issue with the article 'Preparing public managers for the digital era: incorporating information management, use, and technology into public affairs graduate curricula'. This study examines how current public affairs graduate programs prepare students for governing in the digital age and offers suggestions for how to better incorporate information management, use, and technology into public affairs curricula in the United States. Through surveys of graduate program directors and content analysis of course syllabi, this study shows that current curricula have failed to keep pace with rapid changes in industry and society. Courses on information management, use, and technology need to balance their focus on technology with their focus on government. It remains a challenge to integrate information management, use, and technology topics into mainstream management and policy foci.

## **5. Concluding remarks: towards better synergy between digital government and public management**

The analysis presented in this paper tells a story about the characteristics of two scholarly communities. Not surprisingly, we found that the DG and PM scholarly communities vary across several dimensions and also share important similarities. Perhaps most important, there is clear potential for complementary and collaborative work that can contribute to both fields of study. The papers in this special issue, demonstrate how the overlap in interests and the divergence in methods and approaches can produce research that is theoretically robust, methodologically sound, and useful in practice. We hope, other researchers will take this integrative perspective in future studies and argue that this should help advance our current knowledge about the use of information technologies in the public sector.

Towards this end, Dawes (2009) outlined a conceptual framework for considering future research about governance in the digital age. Taking a sociotechnical approach, she proposes that DG is a dynamic open system characterized by six dimensions or themes. These include the purpose and role of government, recognition of broad societal trends, attention to the nature of changing technologies, human elements of choice and self-determination, information creation and management, and ongoing interaction, change, and complexity. Research that takes such a holistic view of digital-age governance requires collaboration among DG and PM researchers. The main purpose of this special issue is to highlight the opportunities for joint efforts and encourage scholars to pursue them. These communities have much in common and also have useful differences that can allow them to challenge one another and produce new knowledge that benefits society.

### **Note**

1. The E-Government Reference Library is available at <http://faculty.washington.edu/jscholl/egr/>

### **Disclosure statement**

No potential conflict of interest was reported by the authors.

## References

- Dawes, S. S. 2013. *Advancing Digital Government: “The Research-Practice-Knowledge Connection”*, *Gestión Y Política Pública*, CIDE, México, Volumen Temático Sobre Gobierno Electrónico, 49–67. Mexico: CIDE.
- Dawes, S. S., and N. C. Helbig. 2015. “The Value and Limits of Government Information Resources for Policy Informatics.” In *Governance in the Information Era: Theory and Practice of Policy Informatics*, edited by E. Johnston. New York: Routledge.
- Dawes, S. S. 2009. “Governance in the Digital Age: A Research and Action Framework for an Uncertain Future.” *Government Information Quarterly* 26 (2): 257–264. doi:10.1016/j.giq.2008.12.003.
- Erman, N., and L. Todorovski. 2009. “Mapping the E-Government Research with Social Network Analysis.” In *International Conference on Electronic Government*, edited by M. A. Wimmer, H. J. Scholl, M. Janssen, and R. Traunmüller, 13–25. Berlin: Springer.
- Fountain, J. E. 2003. *Information, Institutions and Governance: Advancing a Basic Social Science Research Program for Digital Government, Research Working Paper 03-004*. Cambridge, MA: Kennedy School of Government, Harvard University.
- Gil-García, J. R. 2012. *Enacting Electronic Government Success: An Integrative Study of Government-Wide Websites, Organizational Capabilities, and Institutions (Vol. 31)*. New York: Springer.
- Gil-García, J. R., and L. F. Luna-Reyes. 2006. “Integrating Conceptual Approaches to E-Government.” In *Encyclopedia of E-Commerce, E-Government and Mobile Commerce*, edited by M. Khosrow-Pour. Hershey, PA: Idea Group Inc.
- Gil-García, J. R., and T. A. Pardo. 2005. “E-Government Success Factors: Mapping Practical Tools to Theoretical Foundations.” *Government Information Quarterly* 22 (2): 187–216. doi:10.1016/j.giq.2005.02.001.
- Gil-García, J. R., T. A. Pardo, and T. Nam. 2015. “What Makes a City Smart? Identifying Core Components and Proposing an Integrative and Comprehensive Conceptualization.” *Information Polity* 20 (1): 61–87. doi:10.3233/IP-150354.
- Grönlund, Ake y Andersson, Annika. 2006. “E-Gov Research Quality Improvements since 2003: More Rigor, but Research (Perhaps) Redefined.” In *Egov 2006, Lncs 4084*, edited by M. A. Wimmer, H. J. Scholl, A. Grönlund, and K. V. Andersen, 1–12. Berlin Heidelberg: Springer-Verlag.
- Hardy, C. A., and S. P. Williams. 2011. “Assembling E-Government Research Designs: A Transdisciplinary View and Interactive Approach.” *Public Administration Review* 71 (3): 405–413. doi:10.1111/j.1540-6210.2011.02361.x.
- Heeks, R., and S. Bailur. 2007. “Analyzing E-Government Research: Perspectives, Philosophies, Theories, Methods, and Practice.” *Government Information Quarterly* 24: 243–265. doi:10.1016/j.giq.2006.06.005.
- Ho, A. T. 2002. “Reinventing Local Governments and the E-Government Initiative.” *Public Administration Review* 62 (4): 434–441.
- Meijer, A., and V. Bekkers. 2015. “A Metatheory of E-Government: Creating Some Order in a Fragmented Research Field.” *Government Information Quarterly* 32 (3): 237–245. doi:10.1016/j.giq.2015.04.006.
- Moon, M. J., J. Lee, and C.-Y. Roh. 2012. “The Evolution of Internal IT Applications and E-Government Studies in Public Administration: Research Themes and Methods.” *Administration & Society* 2014. Published online on October 1, 2012. doi:10.1177/0095399712459723.
- Ospina, S., and J. Dodge. 2005. “Narrative Inquiry and the Search for Connectedness: Practitioners and Academics Developing Public Administration Scholarship.” *Public Administration Review* 65 (4, July/August). doi:10.1111/j.1540-6210.2005.00468.x.
- Rodríguez Bolívar, M. P., L. Alcaide Muñoz, and A. M. López Hernández. 2014. “Scientometric Study of the Progress and Development of E-Government Research during the Period 2000–2012.” *Information Technology for Development*. doi:10.1080/02681102.2014.927340.
- Rosenbloom, D. H. 1983. “Public Administrative Theory and the Separation of Power.” *Public Administration Review* 43: 219–226. doi:10.2307/976330.
- Rosenbloom, D. H. 1998. *Public Administration: Understanding Management, Politics, and Law in the Public Sector*. New York: McGraw-Hill.

- Scholl, H. J. 2006. "Is E-Government Research a Flash in the Pan or Here for the Long Shot?" In *Electronic Government: Fifth International Conference, EGOV 2006, Vol. LNCS 4084*, edited by M. A. Wimmer, H. J. Scholl, A. Grönlund, and K. V. Andersen, 13–24. Krakow, Poland: Springer.
- Scholl, H. J. 2009. "Profiling the EG Research Community and Its Core." In *Egov 2009, Lncs 5693*, edited by M. A. Wimmer, H. J. Scholl, A. Grönlund, and K. V. Andersen, 1–12. Berlin: Springer-Verlag.
- Scholl, H. J. 2014. "The EGOV Research Community: An Update on Where We Stand." In *Egov 2014, Lncs 8653*, edited by M. Janssen, H. J. Scholl, M. A. Wimmer, and F. E. Bannister, 1–16. New York: Springer.
- Scholl, H. J. 2015. "Electronic Government: A Study Domain Past its Infancy." In *E-Government: Information, Technology, and Transformation*, edited by H. J. Schnoll. New York: Routledge.
- Scholl, H. J. 2016. "Making Sense of Indices and Impact Numbers: Establishing Leading EGOV Scholars' Signatures." In *International Conference on Electronic Government and the Information Systems Perspective*, 3–18. New York: Springer International Publishing.
- UNESCO. 2011. ICTs as Tools for Improving Local Governance; Accessed January 2017. [http://portal.unesco.org/ci/en/ev.php-URL\\_ID=3038&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/ci/en/ev.php-URL_ID=3038&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- Wahid, F. 2012. "The Current State of Research on E-government in Developing Countries: A Literature Review." In *Egov 2012, Lncs 7443*, edited by H. J. Scholl, M. Janssen, C. E. Moe, and L. S. Flak, 1–12. London: Springer.
- West, D. 2003. Urban E-Government, 2003. <http://www.insidepolitics.org/egovt03city.html>
- Wirtz, B. W., and P. Daiser. 2016. "A Meta-Analysis of Empirical E-Government Research and Its Future Research Implications." *International Review of Administrative Sciences* 74 (3): 421–433.
- Yildiz, M. 2007. "E-Government Research: Reviewing the Literature, Limitations, and Ways Forward." *Government Information Quarterly* 24: 646–665. doi:10.1016/j.giq.2007.01.002.
- Yildiz, M. 2013. "Big Questions of E-Government Research." *Information Polity* 17: 343–355.