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INTELLECTUAL FOUNDATIONS AND MAINSTREAM RESEARCH OF E- GOVERNMENT IN PUBLIC ADMINISTRATION

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Intellectual Foundations and Mainstream Research of e-Government in Public Administration

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INTRODUCTION

Since 1990, research in Public Administration has been conducted to study the reforms made in government agencies to apply management techniques from the private sector (Barzelay, 2001; Boyne, 2002; Gore, 1993; Hood, 1991; Moynihan, 2008; Osborne & Gaebler, 1992; Pollitt & Bouckaert, 2004; Terry, 1998), as well as studies related to privatization (Savas, 2000), and network-focused management (Meier & O'Toole Jr., 2001; O'Toole Jr., 1997). More recently, since 2000, research has been conducted on e-government, including the use of information technology in government operations, and its effects on citizens' satisfaction and democratic standards (Fountain, 2001; Ho, 2002; Layne & Lee, 2001; Moon, 2002; D. F. Norris & Moon, 2005; Eric W. Welch, Hinnant, & Moon, 2005; West, 2004).

Studies have recently sought to identify trends in terms of the methods used and research opportunities that have emerged in e-government (Alcaide Muñoz & Rodríguez Bolívar, 2015; Rodríguez Bolívar, Alcaide Muñoz, & López Hernández, 2010, 2012). The consensus of these three investigations was that most e-government studies focus on the United States, followed by the United Kingdom. Accordingly, Joseph (2013) found that despite the steady increase in e-government studies, most occur in Europe, North America, and Asia, highlighting the opportunity for more research in regions such as South America. Alcaide Muñoz and Rodríguez Bolívar (2015) affirmed that e-government has penetrated the public sector with a consequent increase in research since 2000, meaning that this field of study is relatively new (Joseph, 2013). As such, e-government research has had limited time to develop its own conceptual foundations (Heeks & Bailur, 2007).

Although the older but most frequently cited articles in the field anchor their work in previous literature, they often tend not to use specific theories, nor do they clearly present core theories as a foundation for study (Belanger & Carter, 2012). In fact, Heeks and Bailur (2007) stated that e-government research is far from developing its own conceptual foundations because research in the field is neither theory-building nor theory-applying, and has not even reached the level of accumulating knowledge on its own models.

Furthermore, initially, e-government was mainly used in the activities of the executive branch of government, taking advantage of the internet to publish information and facilitate administrative transactions (CEJA, 2012). Accordingly, academic research heavily

1
2
3 emphasized the executive branch of government and government in general (Lan & Anders,
4 2000).

5
6 In this context, the analysis of academic publications on e-government implementation
7 becomes interesting to researchers. Identification, organization and synthesis of literature are
8 useful for detecting published articles on the discipline with different perspectives of its issues
9 and evolution (Vogel, 2013) and ascertaining the state of the art in the field (Ferreira, Pinto, &
10 Serra, 2014). For these purposes, bibliometric analyses are of considerable value.

11
12 Bibliometric analyses help in revealing the interrelations of scholarly works and tracing the
13 development of a field or of certain topics (Hu, Khosa, & Kapucu, 2016).

14
15 This paper examines a bibliometric study on e-government issues on Public
16 Administration research, with concern over identifying the foundations on which studies of e-
17 government are built. Hence, the purpose of this article is to pinpoint the influence of the most
18 cited authors in the field, the relationships between authors and the subtopics and trends of
19 research. To this end, **we conducted citation, co-citation and bibliographic coupling analyses,**
20 **through multivariate statistics,** applied to a sample of articles published in high-quality
21 journals listed in the 2017 Journal Citation Report (JCR) of the Social Sciences Edition of the
22 ISI Web of Science database.

23 24 25 26 27 28 29 30 31 32 **E-GOVERNMENT**

33
34 E-government has become a global phenomenon (Jaeger, 2003) and has been defined in
35 many different ways in the literature. We define e-government as the use of IT in government
36 operations, including its effects on public service delivery, citizens' satisfaction and
37 democratic standards (Dolci, Maçada, & Paiva, 2017; Fountain, 2001; Ho, 2002; Layne &
38 Lee, 2001; Moon, 2002; D. F. Norris & Moon, 2005; Przeybilovicz, Cunha, & Coelho, 2015;
39 Eric W. Welch et al., 2005; West, 2004). In fact, e-government reflects "how governments are
40 trying to find innovative digital solutions to social, economic, political and other pressures,
41 and how they transform themselves in the process" (Janowski, 2015, p. 221).

42
43 Following the trends of change in the provision of public services, e-government research has
44 rapidly moved from the study of website development and stages of growth to improve
45 customer service (Ho, 2002) to the current mainstream topics of open data and smart services
46 and cities, that is to more general e-services (Ancarani, 2005). In this context, the analysis of
47 academic publications on e-government is compelling.

48 49 50 51 52 53 54 55 56 **Previous Reviews on e-government**

57
58 This research sought to review and synthesize the e-government literature (see Table 1
59 for an overview of previous reviews). There has been an evolution in the approaches on how
60

1
2
3 the theme is addressed. Earlier works like those of Scholl (2009) and Dwivedi, Singh, and
4 Williams (2011) aimed to understand the field by identifying the most prolific authors, the
5 kind of journal that is preferred (core or non-core to the field), and by exploitation
6 demographic variables like the author's country of origin, academic departments of affiliation
7 and gender. Pointing out that e-government research is a new domain, Bélanger and Carter
8 (2012) noted a lack of specific theory underlying the works in question and recommended
9 studies with an in-depth discussion to achieve theoretical unity in the field.

15 Scholl (2013) pointed out the increasing interest in e-government in academic research
16 and noticed new research streams linked to digital democracy and management, such as big
17 data, impact on government transparency and governance. Rodríguez-Bolívar, Alcaide-
18 Muñoz, and Hernandez (2014) also noted a lack of theoretical basis on which to model the
19 process. Furthermore, they identified constraints on implantation and popular engagement,
20 and discussed the need for innovation and evolution in e-government processes.

25 Motivating factors for e-participation are addressed as key elements to the success of
26 an e-government implementation process. It is an error to shape the process with the intention
27 of only acting as an information provider, without exchanging information with citizens
28 (Hansson, Belkacem, and Eckberg, 2015). The model must consider population minorities
29 (e.g., the elderly and women) and public managers need to be concerned with motivational
30 factors, such as transparency and trust, even if they have to sacrifice efficiency to enhance e-
31 engagement (Hansson, et al., 2015; Juliani and Oliveira, 2016).

37 Alcaide-Muñoz, Rodríguez-Bolívar, Cobo, and Herrera-Viedma (2017) related e-
38 government processes with smart city management and pointed out the demand for new
39 capabilities in the employment of technology and organizational management to achieve
40 acceptance by the population. The reviews listed comprise the evolution of academic research
41 on e-government, ranging from an understanding of the field to the concerns regarding the
42 engagement of citizens. Factors linked to public policies like transparency and trust are
43 identified as motivational issues and technological capabilities and resource availability are
44 currently discussed.

Table 1. Overview of previous reviews

Title	Authors	Summary	Methodology	Our findings
Profiling the EG Research Community and its Core	Scholl (2009)	<ol style="list-style-type: none"> 1. The paper describes the profile of the e-government researchers' community. 2. It also identifies the preferred outlets between core and non-core journals and conferences. 	Research using the Electronic Government Reference Library (EGRL - 2008)	<ol style="list-style-type: none"> 1. We found that most of the paper depicts e-government aspects in the US and Europe.
Developing a demographic profile of the scholarly community contributing to Electronic Government, an International Journal	Dwivedi, Singh and Williams (2011)	<ol style="list-style-type: none"> 1. A systematic review aiming to depict the current literature of electronic government, using papers published in only one journal. 2. Merely descriptive issues regarding demographic variables. 	Literature review (2000-2004).	<ol style="list-style-type: none"> 1. We found that demographic aspects impact the evolution and status of e-government, regarding issues of the use of digital media
Digitizing Government Interactions with Constituents: An Historical Review of E-Government Research in Information Systems	Bélangier and Carter (2012)	<ol style="list-style-type: none"> 1. No theoretical foundations in the analyzed articles. 2. New articles are recommended to engage in an in-depth discussion to create a theory of e-government, to conduct meta-studies to develop a unifying theory and to link with theories of IS. 	Literature review (2000 to 2010)	<ol style="list-style-type: none"> 1. We also noticed that the literature has not built theoretical foundations on the theme.
Electronic Government Research: Topical Directions and Preferences	Scholl (2013)	<ol style="list-style-type: none"> 1. Interest in e-government research has increased. 2. The main topics of research are those related to digital democracy and management organizations. 3. Novel topics emerged, such as open government and transparency, social media and cloud services and big data. 4. It is suggested that bibliometric research to compare with this survey-generated data should be conducted. 	Web survey with e-government research community	<ol style="list-style-type: none"> 1. We found that e-government has been used to promote efficiency through e-services more than to motivate public participation.

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5	Scientometric Study of the			
6	Progress and Development			
7	of e-Government Research	Rodríguez-Bolívar, Alcaide-Muñoz and		
8	During the Period 2000–	Hernández (2014)	Literature review	1. Research focused particularly on
9	2012			the US.
10				2. We found there is a need of
11				studies involving developing
12				economies.
13				3. We also found that innovation
14	Forums for electronic			adoption in public service has been
15	government scholars:			constrained due to consumption of
16	Insights from a 2012/2013	Scholl and Dwivedi (2014)	Web survey with e-	time and resources.
17	study		government research	
18			community	1. Our findings showed that
19				institutional factors have a decisive
20				impact on e-government adoption.
21				
22				1. We found that e-government is
23				an emerging subfield and
24	Understanding e-government			challenges NPM issues. There has
25	research. A perspective from	Alcaide-Muñoz and Rodríguez-Bolívar		also been an increase in the number
26	the information and library	(2015)	Bibliometric review	of published papers in the last
27	science field of knowledge		(2000-2014)	decade of our research.
28				2. We also found that research in
29				the field is neither theory-building
30				nor theory-applying, and has not
31				even reached the level of
32				accumulating knowledge on its own
33				models.
34				3. Our findings showed that
35				contextual and cultural
36				environments play a significant role
37				in the outcomes of e-government.
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<p>Open Government and Democracy: A Research Review</p>	<p>Hansson, Belkacem, and Ekenberg (2015)</p>	<ol style="list-style-type: none"> 1. There is a lack of tools in which public desires are addressed. 2. The focus is on transparency and information exchange, ignoring participation and collaboration. 3. There is no consideration of diversified groups (such as minorities or women) in the generalized concept of "public". 	<p>Content analysis using 80 articles on e-government.</p>	<ol style="list-style-type: none"> 1. We found that e-government initiatives broaden the perspectives of social value, due to citizens' engagement.
<p>State of research on public services management: Identifying scientific gaps from a bibliometric study</p>	<p>Juliani and Oliveira (2016)</p>	<ol style="list-style-type: none"> 1. The new public management model is the principal object of research on public service management. 2. Gaps in the research mainly involve public service motivation. 	<p>Bibliometric review (2004-2014)</p>	<ol style="list-style-type: none"> 1. Our findings showed that there is an emerging stream regarding e-government models, linking it to social engagement and public service transformation. 2. We argue that there is a relationship between innovation and institutional factors moderating the evolution of e-government models.
<p>Analyzing the scientific evolution of e-Government using a science mapping approach</p>	<p>Alcaide-Muñoz, Rodríguez-Bolívar, Cobo, and Herrera-Viedma (2017)</p>	<ol style="list-style-type: none"> 1. e-government is an evolving research field, but it has not yet reached maturity. 2. The main areas of study are smart cities, e-participation, technologies used, and citizens' acceptance and participation. 	<p>Research using the Electronic Government Reference Library, 2000-2016</p>	<ol style="list-style-type: none"> 1. We related the need for institutional and relationship changes in order to foster e-government adoption.

METHOD

This research was conducted using bibliometric techniques. A bibliometric analysis can complement existing reviews and pinpoint future research opportunities. This type of analysis is useful for identifying influential works and examining research patterns and trends and the intellectual structure of a field (McCain 1990; Ramos-Rodríguez and Ruiz-Navarro 2004). We used complementary bibliometric methods, citation count, co-citation and bibliographic coupling. The results were treated through multivariate statistics.

Citation analysis is based on a count of how frequently a certain work is referenced by others in their own papers. The core assumption is that by delving into the references cited more frequently on a given field we can understand the knowledge base on that field (Vogel and Güttel, 2013). Citation analysis is conducted on the references, i.e., it refers to what the papers in our sample have cited.

A co-citation analysis measures how frequently two articles are jointly cited (McCain, 1990; Small, 1973), representing in a sample the intellectual roots of a field (Zupic & Čater, 2015). Bibliographic coupling measures the frequency with which two documents in a sample have at least one reference in common. This represents the research trends (Vogel & Güttel, 2013), as it considers the overlap of their bibliographies (Kessler, 1963; Zupic & Čater, 2015). The schematic representation of the two techniques is shown in Figure 1.

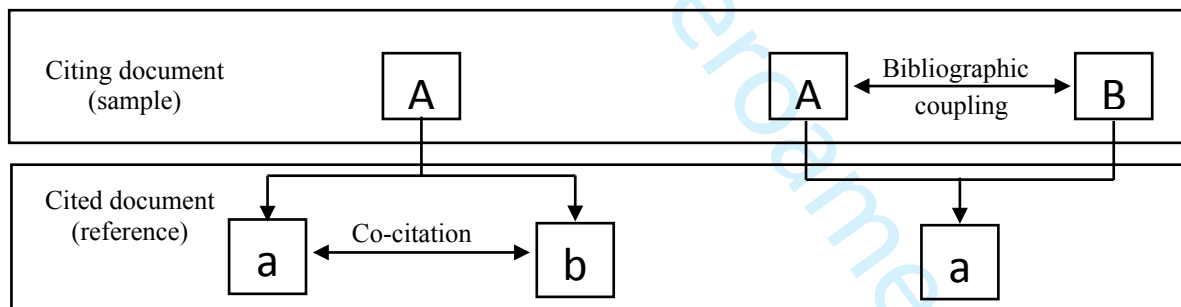


Figure 1. Co-citation and bibliographic coupling
Source: Vogel and Güttel (2013).

Data collection procedures and sample

The data analyzed in this study were collected from 37 top public administration journals with an impact factor greater than 0.8, listed in the 2017 Journal Citation Report (JCR) of the Social Sciences Edition of ISI Web of Science database (Table 2). We chose the Web of Science (www.webofknowledge.com) as it contains the Social Science Citation Index®, providing wide coverage of social science publications with the indexation of respected periodicals (Vogel, & Güttel, 2013). From the 37 journals examined, 21 published e-government research articles

were identified. For further refining, one of the authors read the title, abstract and introduction of each document to validate the sample, reducing the sample to 161 documents. Public Administration Review was the journal with most articles on e-government, accounting for 23% of the 161 selected articles.

Table 2. **Journals and sample**

Journal	JCR - 2017		
	Impact factor	Papers collected	Final sample
Public Administration Review	4.591	37	33
American Review of Public Administration	2.466	24	21
Public Management Review	3.152	20	19
International Review of Administrative Sciences	1.988	19	15
Local Government Studies	1.440	15	14
Administration & Society	1.761	12	11
Journal of Public Administration Research and Theory	3.907	9	7
Public Administration	2.870	8	8
Public Administration and Development	1.250	8	8
Public Performance & Management Review	1.197	8	7
Australian Journal of Public Administration	1.066	6	6
Policy and Politics	1.250	2	2
Environment and Planning C-Government and Policy	1.864	2	2
International Public Management Journal	2.739	2	2
Review of Public Personnel Administration	2.444	2	1
Lex Localis-Journal of Local Self-Government	0.822	2	2
Governance-An International Journal of Policy Administration and Institutions	3.833	1	1
Review of Policy Research	1.250	1	1
Social Policy and Administration	1.418	1	0
Public Money & Management	0.881	1	1
Journal of Comparative Policy Analysis	1.862	1	0
Journal of Policy Analysis and Management	3.444	0	0
Journal of European Public Policy	2.994	0	0
Regulation & Governance	2.735	0	0
Climate Policy	3.832	0	0
Policy Studies Journal	2.830	0	0
Journal of Public Policy	1.262	0	0
Policy Sciences	3.023	0	0
Journal of European Social Policy	1.542	0	0
Science and Public Policy	1.368	0	0
Public Policy and Administration	2.438	0	0
Journal of Social Policy	2.261	0	0
Journal of Accounting and Public Policy	1.796	0	0
Nonprofit Management & Leadership	1.633	0	0
Policy and Society	1.440	0	0
Public Personnel Management	1.364	0	0
Contemporary Economic Policy	0.960	0	0

Total	181	161
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To collect a sample of articles from the selected journals, a keyword search was conducted using “e-government*” in the Topic field of the database. The subsequent “*” was used to capture possible variations of the wording. We collected the works available in the field of Business and Management up to August 2017.

The 161 papers in the final sample were published over the last 15 years, from 2002 to September/2017 (Figure 2). Figure 2 shows the evolution of publications in the dataset denoting a considerable rise from 2007, with a certain stability in the number of published works from that date. Due to the nature of the e-government and internet phenomenon, the theme does not appear to have been widely addressed prior to 2002.

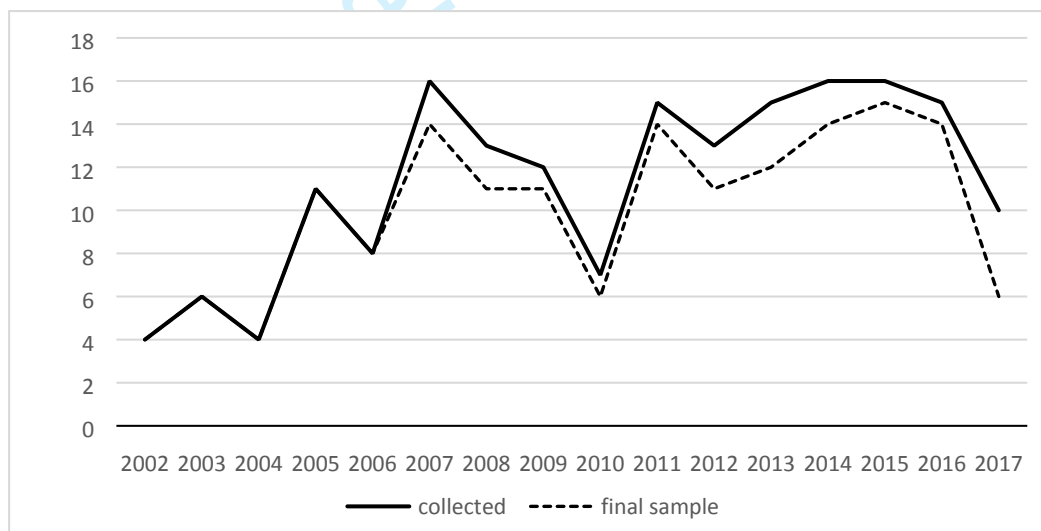


Figure 2. Evolution of publications

Analysis procedures

The sample used over 6000 references, with around 7500 citations. For this article, we considered references with up to 8 citations, reducing the sample to 41 references and 631 citations (10.21% of the citations from the total sample)¹ (Nath, & Jackson, 1991). Bibexcel software (Person, Danell, & Schneider, 2009) was used to retrieve relevant bibliometric information from the sample, such as authors, title, keywords, references, year and journal. To analyze these data, as mentioned above, three procedures were used: citation, co-citation and bibliographic coupling, associated with exploratory factor analysis.

¹ This is in accordance with Lotka’s law of bibliometrics, which states that very few articles (approximately 5%) are representative of the field.

Citation analysis was the first procedure, based on counting how often works are cited in a field or research stream, assuming that authors cite works relevant to their research, with the most cited authors having the greatest influence on the theme. This provides evidence of the *knowledge base* of a field and measures the *influence* of publications (Zupic, & Čater, 2015).

We extracted a co-citation matrix using Bibexcel (Person et al., 2009), further converted into a Pearson correlation matrix during the factor analysis procedure. Exploratory factor analysis (EFA) is the most common clustering method in bibliometrics (McCain, 1990; Zupic, & Čater, 2015). We extracted the factors using the principal components method, with Varimax rotation (Lin, & Cheng, 2010) and Kaiser Normalization in SPSS (version 20). The documents with a factor loading greater than or equal to 0.40 were retained (Shafique, 2013). We attributed the documents with cross-loadings to the factor in which its loading was greater, but we also analyzed their relatedness with other factors (Vogel, & Güttel, 2013). The underlying principle of EFA is that articles with related conceptual aspects compose the same factor (Lin, & Cheng, 2010), meaning that structural knowledge sub-fields can be distinguished (White, 2011).

Bibliographic coupling is used to identify works citing publications in the *knowledge base*, representing the *research front* of a field (Price, 1965). For the bibliographic coupling, we considered articles with at least 4 couplings ($\text{ties} \geq 4$) and at least one document ($\text{node} \geq 1$), reducing to a matrix with 79 articles. We then conducted a similar factor analysis for the bibliometric coupling co-occurrence matrix. The final factor analysis resulted in 63 articles with factor loading greater than or equal to 0.4. For both co-citation and coupling, we named the factors after a detailed analysis of the content of each work.

RESULTS

Citation analysis

Table 3 shows the most cited works in e-government literature. It is worth noting that around 75% of the works, as well as the number of times these works were cited, occurred in the last 15 years, denoting how young research on e-government is and the lack of a robust theory to support the theme.

Table 3. Most cited references

References	Frequency	
	n	%
Moon (2002)	40	24.8
Fountain (2001)	32	19.9

1			
2			
3	Norris and Moon (2005)	31	19.3
4	Ho (2002)	30	18.6
5	Rogers (1962)	28	17.4
6	West (2000)	28	17.4
7	Tolbert and Mossberger (2006)	22	13.7
8	Welch, Hinnant, and Moon (2005)	22	13.7
9	West (2004)	21	13.0
10	Thomas (2003)	20	12.4
11	Coursey and Norris (2008)	19	11.8
12	Layne and Lee (2001)	17	10.6
13	Musso, Weare, and Hale (2000)	16	9.9
14	OECD (2003)	15	9.3
15	Osborne and Gaebler (1992)	15	9.3
16	Weare, Musso, and Hale (1999)	14	8.7
17	Edmiston (2003)	13	8.1
18	Holden, Norris, and Fletcher (2003)	13	8.1
19	Norris (2001)	13	8.1
20	Putnam (2000)	13	8.1
21	Dunleavy (2006)	12	7.5
22	Moon and Norris (2005)	12	7.5
23	West (2005)	12	7.5
24	Brudney and Selden (1995)	11	6.8
25	Ho and Ni (2004)	11	6.8
26	Tolbert, Mossberger, and McNeal (2008)	11	6.8
27	Venkatesh, Morris, Davis, and Davis (2003)	11	6.8
28	Bertot, Jaeger, and Grimes (2010)	10	6.2
29	Bonson, Torres, Royo, and Flores (2012)	10	6.2
30	Chadwick and May (2003)	10	6.2
31	Davis (1989)	10	6.2
32	DiMaggio and Powell (1983)	10	6.2
33	Kraemer and King (2006)	10	6.2
34	Scott (2006)	10	6.2
35	Carter and Belanger (2005)	9	5.6
36	la Porte, Demchak, and Jong (2002)	9	5.6
37	Lipsky (1980)	9	5.6
38	Dunleavy (2005)	8	5.0
39	Reddick (2004)	8	5.0
40	Reddick (2005)	8	5.0
41	Stowers (1999)	8	5.0

Co-citation analysis

The factor analysis used a co-citation matrix of the 41 most cited documents. A total of 3 factors was extracted, which jointly explains 60.8% of the variance. Table 4 shows the

results of classifying the works into the factor on which they loaded highest, with the themes of each factor being the outcome of their designation by the authors.

Table 4. Co-citation factor analysis

	E-government models and evolution (CC1)	E-government implementation factors (CC2)	E-government adoption constraints (CC3)	
Putnam (2000)	.836	Tolbert, Mossberger and McNeal (2008)	.849	Kraemer and King (2006) .716
Chadwick and May (2003)	.775	Stowers (1999)	.802	Dunleavy, Margetts, Bastow, and Tinkler (2006) .601
Welch, Hinnant, and Moon (2005)	.769	DiMaggio and Powell (1983)	.786	Davis (1989) .556
Tolbert and Mossberger (2006)	.740	Reddick (2004)	.779	Venkatesh, Morris, Davis, and Davis (2003) .549
West (2000)	.736	Brudney and Selden (1995)	.776	Reddick (2005) .539
Thomas and Streib (Thomas & Streib, 2003)	.729	Weare, Musso, and Hale (1999)	.756	OECD (2003) .507
Scott (2006)	.716	Ho and Ni (2004)	.707	Rogers (1962) .429
Bertot, Jaeger, and Grimes (2010)	.695	Musso, Weare, and Hale (2000)	.671	
Bonsón, Torres, Royo, and Flores (2012)	.678	Holden, Norris and Fletcher (2003)	.644	
la Porte, Demchak, and Jong (2002)	.671	Edmiston (2003)	.612	
Dunleavy, Margetts, Bastow, and Tinkler (2005)	.648	Carter and Belanger (2005)	.522	
Norris (2001)	.609	Moon and Norris (2005)	.504	
Ho (2002)	.601			
Layne and Lee (2001)	.596			
West (2005)	.595			
Osborne and Gaebler (1992)	.588			
Lipsky (1980)	.584			

Norris and Moon (2005)	.574		
Fountain (2001)	.558		
Coursey and Norris (2008)	.525		
Moon (2002)	.468		
% Variance explained	43.7	10.9	6.2
% Variance accumulated	43.7	54.6	60.8

Notes: 1. Values are the loadings in the factor. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Factor CC1 (with 21 articles) was named **E-government models and evolution**. The articles and books in this factor are concerned with the potential of e-government, e-government models, their status, evolution, and improvements. New Public Management (NPM), implemented mainly in Great Britain and the USA, is challenged due to the impact of the internet and ICTs (Dunleavy et al., 2005). E-government, representing the potential of the use of technology in public service management and delivery, was one of the possibilities to improve the effectiveness of public service (Osborne & Gaebler, 1992). Despite this possibility, e-government implementation poses many challenges (Fountain, 2001). A point in question is the human and political features that influence public service quality, at the discretion of public officers² (Lipsky, 1980).

Considering the potential and challenges of e-government, stage or maturity models were proposed. Stage models are similar in that they propose that e-government initiatives should be developed through sequential and predicted stages (Coursey & Norris, 2008). This usually begins with the online publishing of content and web pages, progressing to more mature stages that consider interactions, transactions and finally social transformation (Layne and Lee 2001; Moon 2002; Norris and Moon 2005).

Since the 1990s, several e-government initiatives have been implemented, initially in developed countries. Their progress has been monitored and criticized, with their proliferation through countries (West, 2005), states and municipalities (West, 2000). Moon (2002), the most cited article, surveying municipal e-government maturity, found that organization size and e-government size are important factors for IT adoption (Norris and Moon 2005). Other works,

² Discretion is related to the freedom of choice of the public officer within the limits of his power to choose a specific action (Davis, 1969).

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3 such as Scott (2006), consider that medium-sized cities, contrary to the previous study, provide
4 more opportunities for public involvement.
5

6 Considering public involvement, there has been growing interest in social capital
7 (Putnam, 2000) as an important source of contribution to better public service delivery. In this
8 case, the internet is a promising resource to avoid the erosion of social capital. However, some
9 authors are skeptical of this potential. Studies have demonstrated that internet users show no
10 difference in civic engagement compared to non-users. There is also concern that ICTs will
11 give wealthy and political people the power to influence public services, with the possible
12 significant alienation of socially disadvantaged people (Norris 2001; Thomas and Streib 2003).
13 E-government initiatives in countries like Great Britain and other European countries did not
14 stimulate public participation and reinforced managerialism³ (Chadwick & May, 2003).
15 Empirical works have identified many challenges to overcome due to traditional public
16 administration ignoring the vaunted potential of e-government emphasizing users' needs and
17 satisfaction (Ho, 2002).
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27 E-government initiatives may help to improve the two visions of public management, the
28 efficiency of public organizations and public participation, i.e., irrespective of philosophical
29 choices (la Porte et al., 2002). E-government is especially a way for public agencies, to gain
30 legitimacy and trust (Tolbert & Mossberger, 2006; Eric W. Welch et al., 2005), for example, to
31 show transparency (la Porte et al., 2002). The integration of e-government and social media
32 appears to be an important means of improving transparency and avoiding corruption (Bertot
33 et al., 2010; Bonsón et al., 2012).
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39 **E-government implementation factors.** Factor CC2 (with 12 articles), considers e-
40 government implementation influenced by institutional factors and resource capacity.
41 Previous studies showed that e-government implementation varies greatly in terms of what it
42 offers and its focus and performance (Stowers, 1999; Tolbert et al., 2008). E-government
43 innovation is usually examined with regard to its adoption time. However, another possibility
44 is to consider its implementation, which faces institutional pressures and resource limitations
45 that could influence decisions and results (Tolbert et al., 2008). For example, a larger
46 population may apply pressure because of citizens' expectations concerning services,
47 meaning a positive relationship for e-government development (Brudney & Selden, 1995);
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58 ³ Managerialism is related to belief in the value of professional managers and their methods and practices, i.e., the
59 application of managerial practices in organizations in a drive for efficiency. Managerialism is also related to the New Public
60 Management idea of a "businesslike" way of managing public organizations (Heckscher & Donnellon, 1994).

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3 Holden et al., 2003; Musso et al., 2000; Weare et al., 1999). The population's access to
4 technology is also an important factor for successful e-government implementation but also
5 leads to pressure from citizens for more and better services (Edmiston, 2003; Moon & Norris,
6 2005) and perceived trustworthiness (Carter & Bélanger, 2005). Conversely, public
7 managers' leadership vision of e-government appears to make a difference (Edmiston, 2003;
8 Ho & Ni, 2004).

9
10 The presence of the work of DiMaggio and Powell (1983) indicates that isomorphic
11 pressures are present in e-government implementation actions and decisions. Formal and
12 informal institutions are important and also shape public policy for e-government
13 implementation. Not only the internet, but also government structure (Tolbert et al., 2008),
14 imposes coercive pressures on e-government initiatives. Moreover, mimetic pressures are
15 imposed by successful peer practices or experience (Holden et al., 2003; Reddick, 2004), for
16 example, from regional neighbors or through national exchanges of experience.

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18 **Factor CC3** (7 articles) was named **e-government adoption**. Innovation adoption is
19 complex, and software adoption, in particular, consumes time and resources (Wirtz, Mory, &
20 Ulrich, 2012). This is no different when it comes to e-government. Despite the promise and
21 importance of e-government adoption (OECD, 2003), IT solutions appear to have been unable
22 to innovate government, merely reinforcing existing structures and power relationships of the
23 public sector (Davis, 1989; Kraemer & King, 2006). E-government absorption time is
24 considered slow and difficult in the eyes of public managers, who perceive it as a complex
25 project to undertake (Kraemer & King, 2006). E-government involves technical and business
26 process implementation, as well as institutional and relationship changes (Dunleavy,
27 Margetts, Bastow, & Tinkler, 2006) and acceptance of technology (Venkatesh, Morris, Davis,
28 & Davis, 2003). The references in this factor indicate a focus on governance, innovation in
29 public service delivery, adoption and implementation, demonstrating that the adoption of e-
30 government is more informational than transactional (Reddick, 2005).

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 **Bibliographic coupling factor analysis**

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51 With the same method used for the co-citation analysis, we conducted factor analysis for the
52 bibliographic coupling of 63 of the total sample of documents. Again, a total of 3 factors was
53 extracted, jointly explaining 55.8% of the variance. Table 5 shows the factor on which they
54 loaded highest. While co-citation shows the intellectual basis of e-government, bibliographic
55 coupling is intended to show the mainstream lines of research.

Table 5. Bibliographic coupling factor analysis

E-government adoption contextual and technological factors (BC1)	E-government evolution status and implementation (BC2)	E-government and social capital (BC3)
Chen and Thurmaier (2008)	.883 Myeong and Choi (2010)	.862 Grimmelikhuijsen and Meijer (2015) .852
Norris and Moon (2005)	.863 Brown (2007)	.855 Milosavljevic, Milanovic and Benkovic (2017) .851
Moynihan (2004)	.844 Justice, Melitski and Smith (2006)	.828 Song and Lee (2016) .835
Lim and Tang (2006)	.802 Streib and Navarro (2006)	.796 Porumbescu (2016b) .791
Homburg, Dijkshoorn and Thaens (2014)	.798 Ahn (2011)	.795 Hetling, Watson and Horgan (2014) .776
Eom (2013)	.797 Ho and Ni (2004)	.791 Nam (2012) .735
Wood, Bernt and Ting (2009)	.795 Nasi, Frosini and Cristofoli (2011)	.783 Porumbescu (2016a) .684
Dawes (2008)	.792 Rodríguez Bolívar, Caba Pérez and López Hernández (2007)	.762 Porumbescu (2017) .672
Sobaci and Eryigit (2015)	.790 Reddick, Abdelsalam and Elkadi (2011)	.758 Ganapati and Reddick (2014) .666
Park, Choi and Bok (2013)	.746 Rodríguez Domínguez, García Sánchez, and Gallego Álvarez (2011)	.757 Agostino and Arnaboldi (2016) .652
Lee, Chang and Berry (2011)	.746 Bekkers (2007)	.756 Bonsón, Royo and Ratkai (2017) .647
Ruano de la Fuente (2014)	.742 Thomas and Streib (2003)	.743 Im, Cho, Porumbescu and Park (2014) .612
Chen and Hsieh (2009)	.739 Serrano-Cinca, Rueda-Tomás and Portillo-Tarragona (2009)	.663 Morgeson, VanAmburg and Mithas (2011) .606
Graham, Gooden and Martin (2016)	.722 Rufin, Medina and Sánchez-Figueroa (2012)	.591 Heflin, London and Mueser (2013) .578
Tolbert, Mossberger and McNeal (2008)	.711 Pina, Torres, and Royo (2007)	.498 Yetano and Royo (2017) .524
Manoharan (2013)	.709 O'Neill (2009)	.443 Ingrams (2016) .501
Moon (2002)	.693 Baldwin, Gauld and Goldfinch (2012)	.442
Tolbert and Mossberger (2006)	.671	
Ahn and Bretschneider (2011)	.655	

Hu and Kapucu (2016)	.608		
Jun, Wang and Wang (2014)	.589		
Li and Feeney (2014)	.582		
Wang and Feeney (Wang & Feeney, 2016)	.553		
Lee (2013)	.541		
Roman (2015)	.498		
Morgeson and Mithas (2009)	.498		
Welch and Pandey (2007)	.496		
Ganapati (2011)	.449		
Welch, Hinnant and Moon (2005)	.410		
% Variance explained	33.40	12.43	9.98
% Variance accumulated	33.40	45.83	55.81

Notes: 1. Values are the loadings in the factor. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Factor BC2 (18 articles) is composed of works concerned with understanding the current situation of **E-government evolution status and implementation**. Despite the interrelation of the co-cited articles, this factor is influenced by e-government evolution (Factor CC1) and implementation factors (Factor CC2). Two articles included in the previous factors are also in the composition of Factor BC2: Thomas and Streib (2003) from Factor CC1 and Ho and Ni (2004) from Factor CC2. The articles generally evaluate, test or question the potential benefits of e-government promises and the expected e-government revolution (Streib & Navarro, 2006).

The works emphasize the importance of institutional factors regarding the implementation of e-government initiatives (Ahn, 2011), as well as possible mimetic isomorphic behavior (Pina et al., 2007). Economic development, including population size, population growth and standard of living favors e-government adoption and implementation (Ahn, 2011; Rodríguez Domínguez et al., 2011; Serrano-Cinca et al., 2009), as well as the public's political awareness and demands (Ahn, 2011).

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3 Some studies were concerned with the digital divide argument, that wealthier, better
4 educated and younger citizens are more likely to use online services (Thomas & Streib, 2003).
5 However, the assessment of demographic groups and their acceptance of the internet suggests
6 that the gulf between them is not so wide. Streib and Navarro (2006), working on a similar
7 population as the work of Thomas and Streib (2003), found that education had a stronger
8 influence on online e-government services than race or income. However, the authors also
9 found that, at the time, half of the population investigated still believed that non-digital
10 government services (p-government) were more effective than digital (e-government). They
11 also suggested that the type of service would have an influence on affluence.

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19 Previous works on e-government implementation considered that, from an
20 administrative viewpoint, it would improve organizational effectiveness, and from an
21 innovation adoption perspective, it would influence resource allocation (Justice et al., 2006).
22 The latter perspective is concerned with the influence of organizational factors on e-
23 government implementation (Bekkers, 2007; Nasi et al., 2011), such as the influence and role
24 of political leadership regarding a consistent vision and direction (Ho & Ni, 2004) and
25 administrative discretion (Reddick et al., 2011).

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Despite the possibilities of potential benefits and organizational initiatives, it seems
that e-government initiatives are lagging regarding the proposed implementation stages
(Justice et al., 2006; O'Neill, 2009). There is concern over the utility of maturational models
when considering the potential benefits of individual organizations (Brown, 2007). For
instance, in the personal view of public servants, the gains are efficiency rather than in
transforming public service (Baldwin et al., 2012), as they seem not to be aware of the
magnitude of the potential gains (Rodríguez Bolívar et al., 2007).

E-government adoption contextual and technological factors (Factor BC1) is
mainly influenced by co-citation factors for e-government evolution (Factor CC1) and
implementation factors (Factor CC2). Only one of the references from Factor CC3, Rogers
(1962, p. 5), considers innovation diffusion as a process “by which an innovation is
communicated through certain channels over time among the members of a social system”.
To the author, there are four main elements in the innovation diffusion process: the type of
innovation, communication channels, time and the social system.

As mentioned above, this factor is influenced by e-government evolution (Factor
CC1). Three articles are also in the co-citation factor: Moon (2002), Welch, Hinnant and
Moon (2005), and Tolbert and Mossberger (2006). Considering co-citation, Factor CC2
shares the article of Tolbert, Mossberger and McNeal (2008). Moon (2002) suggested e-

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3 government in stages or types: e-services, e-participation, and e-democracy. These different
4 stages and types are related to different contexts, goals and tools (Chen & Thurmaier, 2008;
5 Wang & Feeney, 2016). Some authors consider the distinction between e-government and e-
6 democracy, and consider e-governance⁴ as the combination of both (Lee, Chang, and Berry
7 2011). It should be noted that the institutional dimensions of e-government implementation
8 pose the question of why similar initiatives implemented by different [contexts]⁵ produce
9 different outcomes (Eom, 2013, p. 875).

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15 E-government is especially a way for public agencies to improve its interactions with
16 citizens and perceptions of responsiveness (Welch, Hinnant, and Moon 2005; Tolbert and
17 Mossberger 2006; Morgeson, VanAmburg, and Mithas 2011). The offer and delivery of e-
18 government service, from the customer's perspective, has the potential to increase trust and
19 confidence in government through transparency (Welch, Hinnant, and Moon 2005; Tolbert
20 and Mossberger 2006). Past studies seemed to focus on the "supply-side", regarding e-
21 government's potential to improve service delivery capacity (Norris and Moon 2005; Ahn and
22 Bretschneider 2011; Park, Choi, and Bok 2013). However, there is a lack of studies regarding
23 the customer side, or "demand-side" perspective of e-government (Jun et al., 2014;
24 Manoharan, 2013). There are also ethical dilemmas involved (Roman, 2015).

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Despite the adoption, previous studies claimed that, with e-government, adopting web-
based features and tools, even unsophisticated ones, is a slow process (Norris and Moon
2005), with few examples of effective implementation (Wang & Feeney, 2016). Previous
studies stated that despite the importance of citizens' participation, recognition, information
and service delivery are prevalent in e-government initiatives (Norris and Moon 2005).
Internal organizational features and orientation are also important (Lim & Tang, 2006;
Manoharan, 2013; Wood et al., 2009), as is managerial orientation regarding innovation
(Norris and Moon 2005).

The diffusion of e-government, considering the importance of citizen adoption and
participation, appears to be influenced by institutional factors (Homburg et al., 2014) such as
income, living in an urban area, level of education and age (Norris and Moon 2005; Tolbert,
Mossberger, and McNeal 2008; Sobaci and Eryigit 2015; Ruano de la Fuente 2014). Despite

⁴ E-governance considers the impact of IT on the public sector through the combination of e-government and e-democracy. E-government is related to the implementation of the internet in government operations. E-democracy is related to the use of internet tools to allow and encourage interaction between government and citizens and government and businesses (Backus, 2001).

⁵ We substituted "nations" in the original question for [contexts], regarding our interpretation for the articles' content.

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3 the predominant focus on a single tool, usually the website, there is a need to understand the
4 different impacts and characteristics of other tools and multiple web functions (Chen &
5 Thurmaier, 2008; Ganapati, 2011; Moynihan, 2004; Tolbert et al., 2008). Adoption may be
6 influenced by the function of the technology that is used, for instance, if it is internal and
7 restricted, like an intranet, or e-services (Wang & Feeney, 2016). It would also be different if
8 adopting the technology considered e-services or communication technologies (Li & Feeney,
9 2014).

15 E-government should also consider the potential use of ICTs a tool for relationships
16 between networks, regarding data sharing between organizations (Graham et al., 2016),
17 communication between organizations (Hu & Kapucu, 2016), and intra-organizational
18 networks (Lee 2013), such as the intranet (Welch and Pandey 2007; Wang and Feeney 2016).

22 **Factor BC3** (16 articles) was named **E-government and social capital**. Evolution of
23 e-government (Factor CC1) shows the necessary public involvement and growing interest in
24 social capital, and the possibility of e-government avoiding social erosion, as pointed out by
25 Putnam (2000).

29 Public involvement was researched considering engagement and participation. With the
30 advent of the internet, and especially real-time communication and user-generated content, the
31 use of social media⁶ is seen as a way of improving citizen engagement, participation,
32 collaboration and influence (Agostino & Arnaboldi, 2016). The evaluation of engagement
33 through social media tools is intended to quantify the interaction and relationship with citizens,
34 using social media specific metrics (Bonsón et al., 2017). It is also important to understand the
35 contexts of citizens' participation abandonment (Yetano & Royo, 2017) and the contextual
36 experience in emergent and transitional economies (Milosavljevic et al., 2017). However, social
37 media technologies do not only enable connection, but also the co-creation of information
38 (Ingrams, 2016).

46 Social media introduces an important and challenging dimension, becoming an e-
47 government tool or strategy, as it poses opportunities, but also risks to public management
48 (Bonsón et al., 2017). The more citizens spend time online, the more they seem to lose trust in
49 government. However, this relationship is moderated by e-government, which has the potential
50 to improve perceptions of the government's trustworthiness (Im et al., 2014).

59 ⁶ Social media is "a set of online tools that are designed for and centered around social interaction" (Bertot, Jaeger, and
60 Hansen 2012, 30).

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3 The relationship between e-government and trust remains unclear (Porumbescu 2016b;
4 Morgeson, VanAmburg, and Mithas 2011; Nam 2012). Studies have shown that e-
5 government websites seem to have a negative influence on citizens' perceived trust in
6 government. However, on the contrary, social media has a positive effect (Grimmelikhuisen
7 & Meijer, 2015; Porumbescu, 2016b, 2016a, 2017). It has shown that it has the potential to
8 improve trust in government, but this effect may be mediated by government transparency
9 (Song & Lee, 2016), usually delivered by traditional e-government initiatives. This is an
10 apparent concern and a specific challenge in the perception of public managers (Ganapati &
11 Reddick, 2014), especially considering the complexity regarding relationships with citizens
12 (Hetling et al., 2014) and their experiences (Heflin et al., 2013).

21 22 **DISCUSSION**

23
24 We conducted this study to conduct a close examination of the existing literature on e-
25 government. For this purpose, we conducted a bibliometric study of e-government in the
26 public sector. Using a sample of 162 articles published in journals classified in the *ISI Web of*
27 *Knowledge*, from 2002 to 2017, we applied bibliometric techniques such as citation, co-
28 citation and bibliographic coupling analysis. We identified the works that have had a greater
29 impact on the field, their conceptual approaches and the main research trends.

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31 E-government appears to be an emerging subfield of research that is reasonably
32 different from the other traditional streams in public management research. It seems
33 promising in that it challenges NPM and managerialism issues. It studies the use of
34 Information Technology and the internet in government operations and public service. As
35 acknowledged by Alcaide Muñoz & Rodríguez Bolívar (2015), e-government has penetrated
36 the public sector and research on it increased from 2000 to 2014. This indicates that the
37 subfield is relatively new and is aligned with Rodríguez-Bolívar et al. (2014) and Bélanger
38 and Carter (2012).

39
40 Figure 3 shows the findings of our bibliometric review about the overlap of the origins
41 of e-government, represented by the co-citation research, and its impact on the different
42 streams of research that emerge from these initial works, from the bibliographic coupling.
43 The results show that there are conceptual overlaps between the three co-citation factors.
44 Factor CC1 includes articles concerned with the potential and possibilities of e-government
45 and considers possible maturity staged models. Despite the possibilities and the promised
46 effects and citizen participation, e-government has been used more to promote efficiency
47 through e-services. Adoption has been slow and resource consuming, not resulting in

innovation or public service transformation, according to Factor CC3. This serves as an alert for future works to consider the constraints regarding the diffusion of innovation processes.

Considering the constraints, the initial research on implementation (Factor CC3) showed that institutional factors have an important effect on e-government adoption, with the need for further investigation of decisions and the impact of organizational factors.

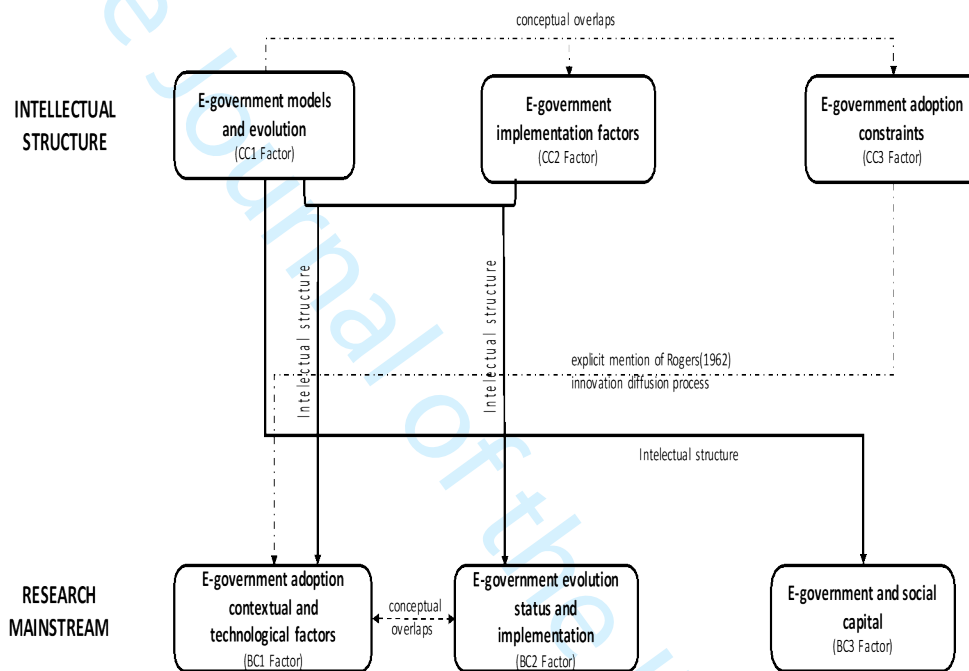


Figure 3. Intellectual structure and mainstream e-government research since 2002

The prior research in e-government models and evolution and the factor for e-government implementation are impacting the current mainstream research agenda. Indeed, it continues as a line of research of the status of e-government evolution and implementation. This shows the predominance of demographic factors such as population size and growth, standard of living and education impacting the evolution and status of e-government. The results showed the existence of the threat of a “digital divide”. However, technological affluence and other external and organizational factors should moderate that threat. Future research should consider longitudinal studies, not only in developed countries but also comparing the evolution to emergent and underdeveloped countries (the latter are also impacted by digital services through telephone companies).

Previous research on e-government also influenced a stream related to e-government adoption regarding contextual and technological factors, representing investigations on the impact of specific contexts and tools. It is concerned with how institutional factors would impact service decisions and diffusion processes, as well as the equilibrium of e-governance, considering e-government and e-democracy, i.e., respectively, striving for efficiency or

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3 citizen participation. It recognizes the contextual differences regarding locations, tools and
4 the supply and demand side perceptions of decisions and challenges involving government
5 relations with other governments and organizations, with citizens and intra-organizational
6 relationships. There are several possibilities for future research, but we must emphasize the
7 question posed by Eom (2013): “Why do similar initiatives implemented in different
8 [contexts]⁷ produce different outcomes?” Research should focus on comparative case studies
9 of successful e-government implementations, either considering traditional e-government or
10 e-democracy. As mentioned, there are several possibilities regarding the use of different tools
11 and contexts. All these works should also consider different institutional environments and
12 cultural influence, which is already a tradition in international business studies, for example.

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21 There is a specific stream of research that emerged from the E-government models and
22 evolution considering e-government and Social Capital. It is an emerging stream that is
23 intended to respond to a criticism of existing e-government initiatives. It is concerned with
24 social engagement and public service transformation. It considers transparency and trust as
25 central, and some specific challenges such as impact of social media on citizens and
26 population, as well as the political and power side of e-government. This, in our view, is an
27 emergent subfield of study in e-government. It is related to e-democracy and also opens up
28 many possibilities considering the institutional environment, power, and political issues.

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This bibliometric analysis contributes to e-government research in different ways. First,
it shows the impact of the initial research on e-government and it points out implications for
public policy and future research directions (Table 6), extracted from current research
streams. Compared to earlier review works, that were more descriptive and concerned with
presenting the topics of the theme, our findings show three main streams of research, two of
which are related and strongly impacted by the initial research (Figure 3). These two streams
are concerned with the factors that influence or impact the implementation of e-government,
and with the implementation process and evolution. Additionally, it also reveals an emerging
stream that responds to criticisms to broaden the perspective and social value of e-government
initiatives, considering social engagement and the real transformation of public service.

Table 6. Insights for future research and implications for public policies

Points to consider
<i>What is the role of institutional constraints such as contextual and cultural environments in the adoption of e-government innovation processes?</i>
<i>How must public policies on e-democracy be shaped to motivate public participation?</i>

⁷ We substituted “nations” in the original question with [contexts], regarding our interpretation for the articles’ content.

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3 · *There is a need for a better understanding of the factors impacting the evolving*
4 *implementation of e-government models:*
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6 *a. factors conditioned to technological capabilities and available resources;*
7 *b. demographic factors such as population size and growth, standard of living and educational level.*
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9 · *Case studies should be conducted on e-government implementation in developing economies*
10 *to confirm earlier findings that it promotes economic growth.*
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12 · *Is there a trade off in e-government and e-democracy processes involving governance*
13 *efficiency and citizen participation?*
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15 · *How does government social capital, such as transparency and trust, shape public service*
16 *transformation leading to social engagement in e-government processes?*
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18 · *e-government frameworks lack quantitative models that point out key performance*
19 *indicators to evaluate results, efficiency and needs with regard to evolution.*
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23 The results also emphasize the contextual impact of e-government and the need to
24 develop conceptual frameworks. Rodríguez-Bolívar, Alcaide-Muñoz, and Hernandez (2014)
25 and Alcaide Muñoz and Rodríguez Bolívar (2015) highlighted the need to develop conceptual
26 frameworks, including quantitative models that allow their efficiency to be measured,
27 evaluating results and adopting reforms to the environment in which they are applied. We
28 found, that despite the steady increase in e-government studies, most of them are conducted in
29 Europe, North America and Asia. This highlights the opportunity for more research in regions
30 such as South America. There are some bibliometric reviews of e-government researches in
31 these countries, such as in Brazil (Juliani and Oliveira, 2017). Nevertheless, these reviews are
32 mainly descriptive, serving as a starting point to understand the research opportunities with
33 regard to our findings.
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38 This study attempts to reflect on e-government research focusing on the public
39 administration context and to further examine the intellectual foundations and mainstream
40 research in the field. *This work helps e-government students and researchers to understand the*
41 *mainstream research in the field and present the references on each stream, based on a*
42 *comprehensive framework, as presented in Figure 3. Additionally, it has public policy*
43 *implications, pointing out antecedents and consequents factors related to the e-government*
44 *process.* The paper also makes a methodological contribution by showing the possibility of
45 integrating co-citation and bibliographic coupling in mapping knowledge complementing
46 each other and broadening understanding of e-government research development (Scholl and
47 Dwivedi, 2014).
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3 This study has limitations that are inherent to bibliometric studies, such as the selection
4 of journals, which do not cover all the published research. It is beyond the scope of a
5 bibliometric study to exhaust all literature, but future works may include nonpublic
6 administration journals that publish information system or information technology research
7 related to public organizational contexts (Hu et al., 2016). Although the findings assessed the
8 impact of books that were cited by the articles in the sample, future research can include
9 knowledge from a wider variety of sources, such as monographs and conference proceedings.
10 Moreover, the selection of journals can be expanded by including those specializing in other
11 areas, such as Computer Science, Communication or Information and Library Sciences.
12 Additional databases can be used to collect articles from different regions of the world, such
13 as Scopus or SciELO for Latin American studies.
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22 The second limitation is the need to choose keywords to obtain the sample. Although
23 they seem a reasonable method for inferring document topics, they are actually an imperfect
24 proxy. This article, despite having captured a significant number of publications, does not
25 consider all the articles related to e-government.
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29 In addition to the proposals for further research introduced in response to the limitations
30 described above, forthcoming studies may extend the findings of this paper by conducting a
31 bibliometric study on one of the identified subfields of research. Furthermore, according to
32 the findings, it would be relevant to replicate this study using journals included in other
33 databases, as well as in the national databases of emerging countries.
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37 **CONCLUDING REMARKS**

38
39 The findings of this study present existing knowledge on e-government research and
40 provide a categorization in terms of research subfields. The relationship of the intellectual
41 structure and current mainstream research highlights research gaps that need development to
42 advance theory building in the field. In emerging countries, there seems to be a need to
43 conduct e-government research that will make a considerable impact on the field. This study
44 may help researchers to focus on the literature that must be reviewed in their quest to make
45 new contributions to the field and propose a future research agenda to guide them. It could
46 also help government and academic institutions in the allocation of resources for research.
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