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E-Government Success Factors and Measures

Theories, Concepts, and Methodologies

J. Ramon Gil-Garcia



Advances in Electronic Government, Digital Divide, and
Regional Development Series

E-Government Success Factors and Measures: Theories, Concepts, and Methodologies

J. Ramon Gil-Garcia

Centro de Investigación y Docencia Económicas (CIDE), Mexico

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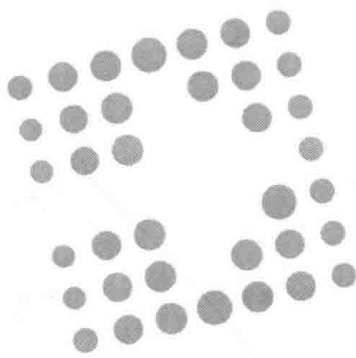
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MISSION

The successful use of digital technologies (including social media and mobile technologies) to provide public services and foster economic development has become an objective for governments around the world. The development towards electronic government (or e-government) not only affects the efficiency and effectiveness of public services, but also has the potential to transform the nature of government interactions with its citizens. Current research and practice on the adoption of electronic/digital government and the implementation in organizations around the world aims to emphasize the extensiveness of this growing field.

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This book is dedicated to Nadia, Dante, and Julieta; their love and support have been essential not only for my academic achievements, but for every moment of my life.

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Foreword

This book is a milestone in a 20-year journey toward understanding e-government success and measures and using that understanding to ensure that government information technologies lead to more democratic, transparent, efficient, and effective public administration. The journey is not a solo one for J. Ramon Gil-Garcia, the editor of this unique and important volume. A growing global community of scholars, practitioners, and students are joining him on this journey. They join him for many reasons, but overall, they strive to make a difference with their work by producing theoretical insights and empirical findings and translating that new knowledge into improvements in the practices of government.

The early days of the e-government journey were characterized by small numbers of scholars and practitioners and few models and methods. This nascent community, as Melvyn Ciment, formerly with the U.S. National Science Foundation (NSF), points out in his personal history (Ciment, 2003) of the development of the digital government research program at the NSF, was focused on making an argument that the government context was different from the business context and required its own focused research program. The small but growing community met resistance to this argument by focusing on the explosion of the Web as a likely game changer in terms of the relationship between government officials and academics. Ciment, and others like him, knew that the demand for new knowledge about technologies, such as the Web, in the governmental context would be needed. This view carried the day and through the efforts of computer and social scientists, including Dr. Sharon Dawes at the Center for Technology in Government, lead author of “Some Assembly Required: Building a Digital Government for the 21st Century,” the NSF Digital Government Research Program was launched. This story, in general terms, has played out in many countries around the world. In many cases, like in the US, a formal e-government research funding program was created; in others, pockets of funding and steely determination fueled development of experts, insights, and communities.

Twenty years later, a truly global community of scholars and practitioners is thriving and realizing the objectives set so many years ago; generating new knowledge about digital government and contributing to improvements in practice. In my role as Director of the Center for Technology in Government and President-elect of the Digital Government Society (DGS) (www.dgsna.org). I have seen this community work together in creative and innovative ways, striving to fill gaps in what is known about e-government and to use that new knowledge to inform practice. Gil-Garcia is at the center of this community, gaining continued recognition for his research and working as a leader in building quality research venues, forming innovative research collaborations, and educating the next generation of scholars and practitioners. In 2009, he was identified as the most prolific among over 900 researchers publishing in digital government; some of his publications have been recognized as among the top-cited articles in leading journals such as *Government Information Quarterly* and among the most read in e-journals such as *Noticide Ciencias*

Sociales. In his work and through this book he encourages the e-government community to invest, along with him, in the development of a more comprehensive view of the “different socio-technical elements and aspects” of e-government. Gil-Garcia’s stature as a global leader in e-government research and his ability to be one moment conceptualizing, the next theorizing, and the one after that an innovative and skilled methodologist, uniquely position him to compile this set of chapters, which brings together some of the best thinking on e-government theories, concepts, and methods.

This who’s who of e-government research brought together by Gil-Garcia provides readers, scholars, and practitioners alike with the most current efforts to theorize and conceptualize e-government success, and new models and methods to test those ideas and measure the impact of newly informed practices. Gil-Garcia’s most recent and acclaimed book, *Enacting Electronic Government Success: An Integrative Study of Government-Wide Websites, Organizational Capabilities, and Institutions* can be seen as setting the stage for this edited book on e-government success factors and measures. Dawes (2012), in her foreword to *Enacting Electronic Government Success: An Integrative Study of Government-Wide Websites, Organizational Capabilities, and Institutions*, identifies the strength of Gil-Garcia’s work as stemming from “the way it integrates policy, organizational, and technological factors within a larger institutional and societal environment. The empirical, multi-method study offers important contributions to the emerging field of digital government research as well as to more fundamental aspects of organization studies, public administration, and public policy.” The chapters presented here in *E-Government Success Factors and Measures* continue to support the argument that Ciment, Dawes, and Gil-Garcia, and other pioneers in this community have persistently made: if we are to realize the full-potential of technology in government, new knowledge about the socio-technical elements of e-government must be created through research and used in practice.

Wherever I go in the world I see governments striving to meet their commitment to citizens through the use of technology. Their efforts are focused on adapting new and emerging technologies as well as leveraging their investments in legacy systems. Regardless of the nature of the technology and the extent of organizational and institutional transformation required to deliver value to citizens, the same questions arise: how can we avoid failure? How can we be sure that the investments we are making are the right ones? How do we know if we have the right policies, procedures, and people in place to ensure that we can successfully meet our commitment to citizens? How do we measure the impact of our efforts? Whether investing in new social media strategies to engage citizens on a very specific issue such as a new park or a new bus line or implementing a new government-wide procurement system, the overriding question is the same: How can we know? We can only know if we continue to invest, as a community, in the development of related theories and concepts and by refining the skills and tools needed to hold ourselves and others accountable for the ideas they offer and the models they prescribe.

The carefully selected chapters of *E-Government Success Factors and Measures: Theories, Concepts, and Methodologies* provide students, practitioners, and researchers with a comprehensive look at the current state of understanding about e-government success factors and measures and lays the foundation for their future individual and collective efforts. The work of Luna-Reyes and Andersen in the opening chapter of the theory section sets the tone immediately for the book by raising a question about the relative utility of a factor approach to understanding success and failure in e-government. Their work, which uses causal mapping in the creation of a generic theory of interorganizational cross-boundary electronic government projects, they claim, suggests that such mapping, which relies on recursive structures, might be an appropriate alternative to the factor approach. Similarly, Dawes, in her chapter in the concepts section, takes us beyond success measures for e-government per se and calls for a thorough consideration

of the enabling conditions in the larger environment. The final section of the book draws our attention to the methodological issues and challenges of e-government research, and Bouaziz and Chaabouni, in particular, draw our attention to the challenges of “exploring the dynamic nature of citizen response to e-government.” Their chapter introduces how recent advances in Internet search technology may offer new opportunities to answer these questions. These three chapters and the 14 that complete the volume meet the mark set for this work by Gil-Garcia; they provide the reader with some of the latest work in the area of e-government success and provide a foundation for the reader to begin to imagine the next phase of development of the digital government research and practice community worldwide.

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Theresa A. Pardo, a globally recognized expert on Information and Communication Technology (ICT) innovation and transformational government, is director of the Center for Technology in Government at the University at Albany, State University of New York. Among her many leadership roles, Dr. Pardo is a member of the editorial board of *Government Information Quarterly* and President-elect of the Digital Government Society. She is a founding member of the Smart City, Smart Government International Research and Practice Consortium, and an expert on open government and the “opening” of government data. Dr. Pardo is on the faculty of the Department of Public Administration at the Rockefeller College of Public Affairs and Policy and the Informatics Department at the College of Computing and Information both at the University at Albany, State University of New York.

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Preface

Countries around the world have increasingly used electronic government as a strategy for administrative reform (Gil-Garcia, 2012). Public managers, government officials, and policy makers devote time and financial resources to e-government in an attempt to achieve several potential benefits. However, e-government projects frequently fail to deliver the expected results in terms of outputs and outcomes. Failure appears to be related to numerous technical, organizational, institutional, and contextual factors (Gil-Garcia, 2012). Failure rates, when compared to the expected potential benefits, have practitioners and academics thinking that government information technologies have not yet accomplished their pledge of a more democratic, transparent, efficient, and effective public administration (Ashurst, Doherty, & Peppard, 2008; Chen, Zhang, & Lai, 2009; Cook, LaVigne, Pagano, Dawes, & Pardo, 2002; Garson, 2004; Joseph, 2010; Wu, Wu, & Wen, 2010).

INTEGRATIVE FRAMEWORKS TO UNDERSTAND E-GOVERNMENT SUCCESS

In searching for an explanation of such poor results, there are two related limitations to the scope of government information technology research as reflected in the previous academic literature. First, e-government initiatives need to be understood as having technological components, but also social and organizational relationships, as well as the interactions among social actors and between these actors and the technological artifacts (Cordella & Iannacci, 2010; Fountain, 2008; Gil-Garcia & Helbig, 2006; Iannacci, 2010; Margetts, 2009; Orlikowski, 2008; Orlikowski & Scott, 2008; Sefyrin & Mörtberg, 2009). Therefore, in order to attain a better understanding of e-government, it is necessary to develop a more comprehensive view of the different socio-technical elements included in this phenomenon (Gil-Garcia, 2012). Second, previous research overestimated the transformational power of information technologies (Andersen et al., 2010; Kling, Rosenbaum, & Hert, 1998; Mergel, Schweik, & Fountain, 2009; Parisopoulos, Tambouris, & Tarabanis, 2009; Reddick, 2010). E-government success cannot be seen as the measurement of results only.

To be able to study the success of e-government projects, it is first necessary to define what electronic government entails. Although electronic government is not a theoretical construct with a shared definition that scholars universally accept, it can be seen as the selection, implementation, design, and use of ICT in public administrations to supply government services, advance administrative effectiveness, endorse democratic values and participation media, and improve the legal and regulatory framework that enables information intensive projects and promotes the knowledge society (Gil-García & Luna-Reyes, 2008; Gil-Garcia & Luna-Reyes, 2003, 2006). Therefore, the overall success of electronic government

should be clearly related to the achievement of goals and objectives regarding the delivery of services, the improvement of managerial effectiveness (including efficiency), the endorsement of participation and other democratic mechanisms, and the creation of an appropriate legal and regulatory framework (Gil-García & Luna-Reyes, 2007). Considering all of the complexity noted above, we argue that understanding the relationships between e-government success and different institutional, organizational, and environmental factors has become imperative (Gil-Garcia, 2012). In order to achieve this understanding, an integrative framework is better suited for studying electronic government success.

The ensemble view of information technology and organization identifies a dynamic interaction between information technologies and social structures (Cordella & Iannacci, 2010; Criado, 2010; Fountain, 2001; Leonardi, 2009; Orlikowski, 2000, 2008). In this view, information technologies have the potential to transform social and organizational structures, while organizational and social structures could simultaneously affect the use of information technologies. If information technologies do not automatically change social structures and social structures do not determine the characteristics of information technologies, it is necessary to analyze the technological objects, as well as the social and organizational features around those artifacts (Fountain, 2008; Gil-Garcia, 2005a; Puron Cid & Gil-Garcia, 2004). In the literature there are some examples of such integrative views like structuration theory, adaptive structuration theory, institutional theory, socio-technical systems theory, and social informatics. The following paragraphs explain some of their main arguments.

From the structuration theory perspective, human actions and the broader social world are mutually constitutive (Giddens, 1984). At the same time that individual actions are constrained by certain social-level rules, their practices shape or reinforce those social structures (DeSanctis, et al., 2010; Orlikowski, 2008; Shachaf & Rosenbaum, 2010; Whittington, 2010). These social practices can refer to both relationships between individuals and relationships between individuals and technological artifacts (Gil-García & Hassan, 2008). There is an interaction between actions and structures, and therefore, there is no clear causality between social structures and individual actions (Elliott, 2010; Grgecic & Rosenkranz, 2008; Whittington, 2010). Structuration theory states that by defining the ways people think, options for behavior, and ranges of possible consequences, technologies *structure* the social world (DeSanctis & Poole, 1994; Hunter, 2010; Jones & Karsten, 2008; Orlikowski, 1992, 2010). Hence, institutional properties of an organization are influenced by reinforcing or transforming structures of signification, domination, and legitimation. Therefore, users socially construct information technologies as they select and emphasize some of their properties. In contrast, the features of the technology also affect how actors can use it and what they could use it for.

Similarly, there are two central concepts for Adaptive Structuration Theory (AST): appropriation and structuration (DeSanctis & Poole, 1994). These two theoretical constructs focus on the dynamic nature of technology use and adoption in organizational settings. For AST, appropriation is the immediate visible actions, which are evidence of deeper structuration processes. In contrast, structuration is the process by which social structures are produced and reproduced in social life (DeSanctis & Poole, 1994, p. 128). AST also proposes two components of the social structures of information technologies: structural features and spirit (DeSanctis & Poole, 1994). Users can appropriate different structural features and adopt or change the spirit of the technologies. They generate different social structures derived from their interactions with the system and with other users, designers, and managers. Social interaction impacts the appropriation of structures and decision processes by creating decision outcomes and influencing new social structures (rules and resources) and emergent sources of structures.

From the socio-technical perspective, implementation is an ongoing social process rather than a one-shot activity. Hence, the effects of technology are not immediate and direct. IT projects need socio-technical support in addition to IT infrastructures. Social relationships cannot be easily changed according to IT specific requirements; they are complex and have to be negotiated. Based on this socio-technical perspective, Kraemer et al. (1989) propose a model called the process model of computing change. The authors argue that managerial voluntarism and environmental determinism offer partial explanations for the use of IT in organizations. Therefore, their model acknowledges the important role of managers, but also the influence of internal and external environmental variables. All environmental factors have an impact, but this liaison is not direct—managers mediate it through their actions. The main role of managers in this model is to transform environmental opportunities and constraints into computing policies. Objective outcomes are the observed results, while subjective outcomes are the perceptions and interpretations of those results by different groups within the organization (Kraemer, et al., 1989). Both objective and subjective consequences of computing outcomes can affect the broader organization, the community environment, and the extra-community environment (Kraemer, et al., 1989). Therefore, this process model of computing change involves a series of complex and recursive causal relationships.

The technology enactment framework is another good example of an integrative framework that aims to understand the effect of organizational structures and institutional conditions on the use, design, and implementation of government IT initiatives (Cordella & Iannacci, 2010; Hassan & Gil-Garcia, 2008). With institutional theory, it is possible to identify power structures and how they relate to technological systems, in order to propose changes to the institutional environment that could influence both technological aspects and organizational structures and processes (Battilana, Leca, & Boxenbaum, 2009; Lu, Tsang, & Peng, 2008; Scott, 2010; Wry, Greenwood, Jennings, & Lounsbury, 2010). The technology enactment framework argues that objective information technologies are modified in some way by inter-organizational and organizational features and become enacted technologies (Cordella & Iannacci, 2010; Feldman & Horan, 2013; Gil-Garcia, 2006; Herrera & Gil-Garcia, 2010; Lee, Rainey, & Chun, 2009; Luna-Reyes & Gil-Garcia, 2011; Tsai, Choi, & Perry, 2009; Yildiz, 2007). Thus, the enacted technology could be seen as not only the technological characteristics of the current system, but also the manner in which users benefit from those characteristics (Fountain, 2001; Hassan & Gil-Garcia, 2008). The recursive argument is that the resulting enacted technology produces certain organizational outcomes (good or bad), which produce modifications to the technology itself, but may also lead to transformations in the organizational forms or even the institutional arrangements (Fountain, 2001, 2008; Gil-Garcia, 2005b, 2006; Gil-Garcia & Luna-Reyes, 2009).

Social constructionist views also acknowledge mutual causality and multiple determinations of outcomes from individual actions (Holstein & Gubrium, 2008; Irwin, 2011; Lock & Strong, 2010, 1982). There are two main perspectives within this theoretical tradition (Pfeffer, 1982, p. 209). First, the interactionist approach argues that it is through social interaction that individuals derive meaning, which each individual then interprets differently. In contrast, the structuralist approach maintains that regardless of the lens through which people perceive reality, it exists on its own. Sociologists of technology contend that linear models are not capable of accounting for complex social relationships, and they take the perspectives of different social groups into consideration for the analysis (Bartis & Mitev, 2008; Howcroft & Light, 2010; Stahl, 2008).

Sarker (2000) developed a model that considers culture, sub-cultures, and frames as social filters through which different social groups subjectively experience the objective reality. Unlike most previous views, this socio-technical model recognizes the importance of multiple elements in a technological

system such as structure, tasks, people, and technology. According to Sarker (2000), objective realities are socially constructed, but their degree of institutionalization makes social actors take them for granted as if they were part of the natural world. In contrast, subjective realities are affected by an individual's background, position, culture, and role in the organization. They refer to how individuals give differentiated meanings to what may appear to be the same objective reality. This body of work suggests that both objective and subjective realities are important in understanding organizational dynamics in general and government IT initiatives in particular (Hossain, Moon, Kim, & Choe, 2013; Ruuska & Teigland, 2009; Scholl, 2008; Tsai, et al., 2009; Tseng, 2008).

Orlikowski's approach acknowledges that all interactions are situational; different groups can enact different properties of the technologies according to their own norms, facilities, and interpretative schemes (Harrison, Pardo, Gil-García, Thompson, & Juraga, 2007; Orlikowski, 2000). Building on this idea, different enactments can result from what may appear to be the same technological properties. Therefore, social groups with different job positions, personal interests, and professional backgrounds are expected to enact differentiated "technologies in practice," even when the technological artifact is essentially the same (Gil-Garcia & Hassan, 2008; Hardy, 2010; Leonardi, 2010; Leonardi & Barley, 2008; Meneklis & Douligeris, 2008; Orlikowski, 2008). The social and economic practices are dynamic and context-specific. Therefore, different social groups will enact different technologies-in-practice, but the same social group will also enact different technologies-in-practice at different times and spaces (e.g., past, present, future).

As the brief summaries show, the ensemble view of technology provides a framework to study electronic government success in a comprehensive and integrative manner. From hardware to organizational technologies, from internal systems to services provided through the Internet, from laptops and computers in a government office to sophisticated information systems that require data sharing and crossing institutional boundaries, it is clear that electronic government has multiple meanings for diverse social actors and different contexts (Cordella & Iannacci, 2010; Gil-Garcia & Luna-Reyes, 2003, 2006; Hardy & Williams, 2008; Luna-Reyes & Gil-Garcia, 2011; Schelin, 2003; Scholl, Mai, & Fidel, 2006). In order to study, understand, and measure success, it is imperative to take this reality into consideration. Regardless of which theoretical approach is used, the research and knowledge of electronic government success will only thrive through serious, comprehensive frameworks and complex research designs. Several of the chapters in this book are good examples of such efforts.

AUDIENCE AND CONTENT OF THE BOOK

This book should be interesting and useful to professionals and researchers working in the field of government information technologies in various disciplines, e.g. public administration, administrative sciences and management, political science, sociology, communication, information science, computer science, and information technology, among others. Moreover, the book provides insights and support to government executives concerned with the development, implementation, management, and evaluation of complex e-government initiatives. Researchers and graduate students will also find the book useful for their theoretical development and as the basis for future research on related e-government topics.

The first section includes multiple efforts to develop theories. Within this section, in their chapter titled "Towards a Theory of E-Government Interorganizational Collaboration: Generic Structures for Cross-Boundary Requirements Analysis," Luna-Reyes and Andersen present a series of causal maps that constitute an initial effort to create a generic theory of interorganizational cross-boundary electronic

government projects. Through a simulation-based study, they explored the interactions and social processes associated with the development of trust and knowledge sharing in the development of an inter-organizational e-Government application in New York State: the Homeless Information Management System (HIMS). The chapter includes the main theoretical and practical implications of the modeling and simulation work, as well as a discussion of some paths to continue their exploration of collaboration in this specific context. The authors find that a recursive structures approach constitutes an alternative for understanding success and failure in digital government.

Also proposing a theoretical model in “Modeling IT Evolution in E-Government: Theories and a Proposed Model,” Ganapati and Reddick present a critical review of the models of e-government in adopting Information Technology (IT). The authors argue that previous models do not sufficiently encompass existing and emerging information technologies; hence, they fall short on incorporating the institutional context and do not consider the nature of e-government services. The chapter provides an alternative roadmap of modeling IT adoption that builds on the elements of existing e-government models and takes into account the three dimensions of technology, institutions, and services. Likewise, Cordella includes institutional and organizational factors in his study of e-government. The chapter “E-Government Success: How to Account for ICT, Administrative Rationalization, and Institutional Change” assumes that e-government is a complex undertaking which encompasses technological, organizational, and institutional elements. The author offers a rich account of the role ICTs play in transforming public sector organizations, particularly in the rationalization of administrative procedures and public sector institutional transformations. The author introduces the notion of techno-institutional assemblages to offer a new theoretical ground to frame the notion of success in e-government projects. In Cordella’s view, successful e-government policies are the ones that deliver the outcomes, which have inspired their creation.

Niehaves and colleagues include the citizen as a variable in e-government success. In the chapter “The Digital Divide vs. the E-Government Divide: Do Socio-Demographic Variables (Still) Impact E-Government Use among Onliners?” The authors claim the prerequisite for success is citizens’ access and usage. They argue that a gap exists between adopters and non-adopters of e-Government services. Being online is a necessary pre-requisite for consuming Internet-based e-Government services. Their study develops a research framework, where the cumulative effect of e-Government adoption (among all people) is split into a) the digital divide effect and b) the e-Government divide effect (across Internet users). Their findings reveal two important success factors for e-government: the Internet literacy of citizens and targeting e-Government services at less educated citizens. The authors discuss implications for theory and recommendations for practice.

Closing this first section, Hébert examines e-Government evaluation practices anthropologically by questioning their theoretical and methodological assumptions. In “Anthropological Thinking about E-Government Evaluation” the scope of analysis is the manner in which e-government evaluation is conducted, the objectivity it invokes, and the discourse through which its findings are generalized to the broader public. The intended audience of this chapter includes policy workers and academic researchers who rely on online surveys to assess the citizen experience of e-Government and seek to expand their evaluative repertoire ethnographically.

The second section, titled *Concepts*, should also be of interest to scholars and researchers looking for new ways to understand electronic government success and broader factors related to it. In her chapter, Dawes focuses on success in Public Sector Knowledge Networks (PSKNs) by considering measures of structure, performance, and interaction. The chapter “Public Sector Knowledge Networks: Measures and Conditions for Success” actually goes beyond success measures and discusses the conditions for