Understanding the Complexity in Electronic Government: Implications from the Digital Divide literature

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ABSTRACT

E-government has been recognized as a catalyst or tool for government administrative reform. Information technologies have the potential to produce cost savings, improve the quality of services, and make government policies more effective. However, some scholars and practitioners contend e-government has not delivered the promise of more efficient, effective, and democratic public administration. In fact, Heeks (2003) estimates that the failure rate of e-government projects may be as high as 85%. We argue that e-government and digital divide research have been relatively disconnected and important intersections exist between the two. These intersections may be useful to explain some of the failures in e-government projects and policies. Theoretically and practically, e-government and digital divide are intertwined and, therefore, a better understanding can be gained if scholars start analyzing them as complementary social phenomena. This paper reviews current literature in e-government and the digital divide and highlights some important similarities and differences. It also suggests preliminary implications for e-government research and practice.

Keywords

Electronic Government, Digital Government, Digital Divide, Policy Implications, Theory, IT Success.

INTRODUCTION

E-government has been recognized as a catalyst or tool for government administrative reform (CEG, 2001; Heeks, 1999; Kraemer & King, 2003). Scholars suggest information technologies have the potential not only to improve the quality of services, but also to produce cost savings and make government policies and programs more effective (Bourquard, 2003; Garson, 2004; Gartner, 2000; Grönlund, 2001). However, Heeks (2003) estimates that the failure rate of e-government projects may be as high as 85%. Therefore, despite the possibilities of e-government, scholars and practitioners argue information technologies (IT) in general, and e-government in particular, have not accomplished the promise of a more efficient, effective, and democratic public administration (Cook, LaVigne, Pagano, Dawes, & Pardo, 2002; Davies, 2004; Garson, 2004). This is a clear indication that research on e-government is not addressing some important factors. The purpose of presenting these two literatures is not to discuss well-known problematics already discussed in previous studies. This paper is an attempt to explore the theoretical and practical intersections of these two areas of study to show how they complement each other and further enrich the explanatory power of e-government theoretical models. We also contend that practitioners' recognizing important intersections between the digital divide and e-government literatures can help in developing better e-government policies and implementation strategies. This paper is organized in four sections. The first and second present the different approaches to studying e-government and the digital divide, respectively. Section three identifies some parallels in the study of e-government and the digital divide and explores the implications for theory and practice. Finally, section four provides some concluding remarks.

E-GOVERNMENT: EXPLORING THE ABYSS

There is no clear consensus about the concept or definition of e-government; however, there are some common elements between definitions (Holden, Norris, & Fletcher, 2003). Definitions range from descriptive to value-laden. In general terms, electronic government is the use of information and communication technologies in government settings. From an extensive review of current e-government literature, two dominant approaches can be identified (Gil-García, 2005): (1) transformational approach and (2) contingent approach.

Tranformational Approach: E-government Benefits

Similar to technological determinism, the first approach emphasizes the transformational power of information technologies and their impacts on organizational structures and outcomes as e-government benefits. Figure 1 shows the unidirectional causality assumption that technology is the ultimate solution for a variety of government problems. In the literature, several benefits are highlighted, such as increased productivity, improved decision-making, decentralization, reduced costs, increased revenues, or integrated services (Danziger & Kraemer, 1985; Jenster, 1987; Roldán & Leal, 2003). The benefits are expected to come almost automatically and are considered "the reasons for embracing e-government as a means of reforming public management and contributing to broader policy objectives." (Ho, 2002; OCDE, 2003, p. 28). A vast corpus of research continues to identify and analyze these potential benefits (Brown, 2001; Dawes, 1996; Jarque Uribe, 1998; Moon, 2002; OCDE, 2003; O'Looney, 2002).

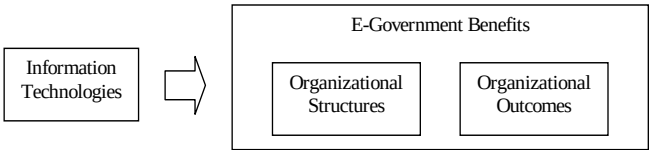

Figure 1. Transformational Approach: E-Government Benefits

Contingent Approach: E-government Success Factors

The second approach emphasizes the impact that contextual, environmental, institutional, and organizational factors impose regarding the selection, design, and use of information technologies (Caffrey, 1998; Dawes & Pardo, 2002; Garson, 2003b; Landsbergen & Wolken, 2001; Pardo & Scholl, 2002). Different theoretical views have suggested different factors that are considered relevant to understanding information technology in organizations. In general terms, success factors can be divided in environmental, institutional, organizational, data related, and technological (Dawes, 1996; Gil-García, 2005; Gil-García & Pardo, forthcoming).

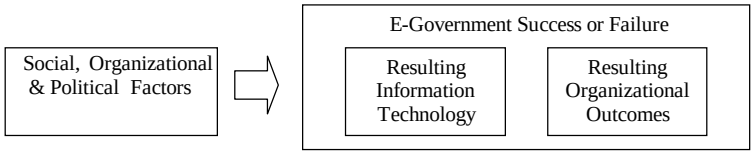

Figure 2. Contingent Approach: E-Government Success Factors

Emergent Approach: E-government Enactment

The two research directions discussed above have generated knowledge about information technology in government. However, e-government initiatives are continuing to increase in complexity and will require both a deep knowledge of the project itself and the contexts in which it is embedded. Recent attempts have been made to empirically test this complexity and have shown the relationship between these two constructs (technology and organizational, behavioral, institutional and cultural aspects) to be recursive in nature (DeSanctis & Poole, 1994; Fountain, 2001; Kraemer, King, Dunkle, & Lane, 1989; W. Orlikowski, 2000; W. J. Orlikowski, 1992). Orlikowski and Iacono (2001) called this approach the ensemble view of information technology and organization. Within this more comprehensive and dynamic approach, e-government is thought

of as enacted by complex relationships between social actors and the context in which they are embedded (Fountain, 2001; W. Orlikowski, 2000).

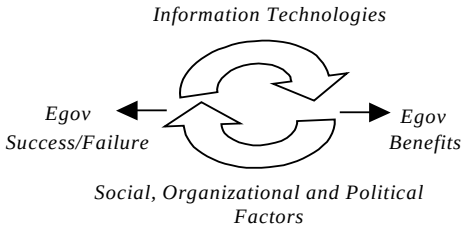

Figure 3. Emergent Approach: E-Government Enactment

DIGITAL DIVIDE: EXPLORING THE ABYSS

Various ways have been used to characterize and define the digital divide. Generally, definitions involve describing the relationship between individuals and technology; however, a review of the literature suggests that technology is most often referred to as computer technology (i.e., hardware and software). This section presents three common approaches of how the digital divide is understood, they are: (1) access divide, (2) multi-dimensional digital divide, and (3) multi-perspective digital divide.

Access Divide: Simple Dichotomy

The most simple and polarizing account expresses a separation between the "haves" and "have nots." Accordingly, this definition implies that the "haves" have access to technology and computers and the have nots, do not (Compaine, 2001). Furthermore, this viewpoint believes that a gap exists solely because of an 'access to technology problem' and that there is an inherent delay in the diffusion of technology among different geographic areas and social groups (Adriani & Becchetti, 2003; Benjamin, 2001; Compaine, 2001). This view generally suggests that the market will eventually close the "perceived" gap over time and that public intervention is not necessary.

Figure 4. Access Digital Divide

A Multi-Dimensional Digital Divide

A competing definition has challenged the simple access dichotomy. In this view, the digital divide is not just about access but more about other social, political, educational, and economic issues. Definitions use demographic attributes such as race, ethnicity, income, and geography to express differences among groups and see the digital divide or divides as a mirror of social inequality (Castells, 2001; Norris, 2001; Warschauer, 2003). For instance, Norris (2001) suggests there are three divides: (1) the global divide, (2) the social divide, and (3) the democratic divide. Mossberger et al. (2003) adds two more: (4) the skills divide, and (5) the economic opportunity divide. These two models are just examples of many other types of multi-dimensional approaches to the digital divide (Ferro, 2005; Servon, 2002). Generally, this view advocates for public intervention and does not see the market as being able to close the gap over time with respect to access (Chin & Fairlie, 2004; Cole & others, 2004), information literacy, employment opportunities, or community redevelopment.

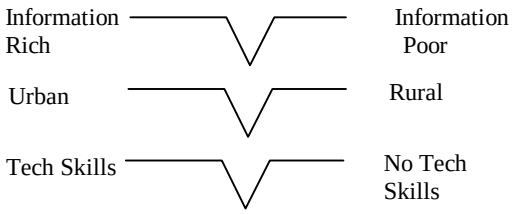

Figure 5. A Multi-Dimensional Digital Divide

A Multi-Perspective Digital Divide

Recently, activists, scholars and practitioners are questioning whether the concept of the digital divide, as represented in early studies, actually provides an accurate portrayal of reality. Therefore, scholars have begun re-theorizing technology's relationship with race, gender and culture. In this view point, scholars reject that any one group of individuals inherently use technologies differently than the majority, but "recognize that individuals and communities employ technologies for very specific goals, linked often to their histories and social locations" (Hines, Nelson, & Tu, 2001). It is the combination of histories and social locations that constitute the multiple perspectives an individual holds. These scholars argue, "barriers to access [and use] operate on many levels and therefore solutions must take multiple approaches" (Hines et al., 2001). In this view, the multiple perspectives an individual holds is brought to the center of any discussion about technology (i.e., centering the subject) (Crenshaw, 1999) and circumstances are evaluated based on how the intersections of their race, gender, class, worldview etc. come together (Servon, 2002).

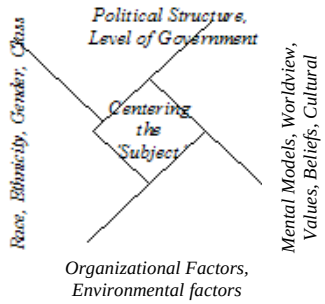

Figure 6. A Multi-Perspective Digital Divide

SOME INTERSECTIONS AND PRELIMINARY IMPLICATIONS

The previous sections described the development of each field in tandem. One of the objectives of this paper is to show that electronic government research and digital divide research have been evolving with important intersections but little interaction. Both fields of study seem to be moving toward more complex and sophisticated understandings of the phenomena and there are important similarities and differences between their philosophical stances and theoretical lenses. Figure 7 sets the context for the discussion. The three levels show that both fields have progressed similarly.

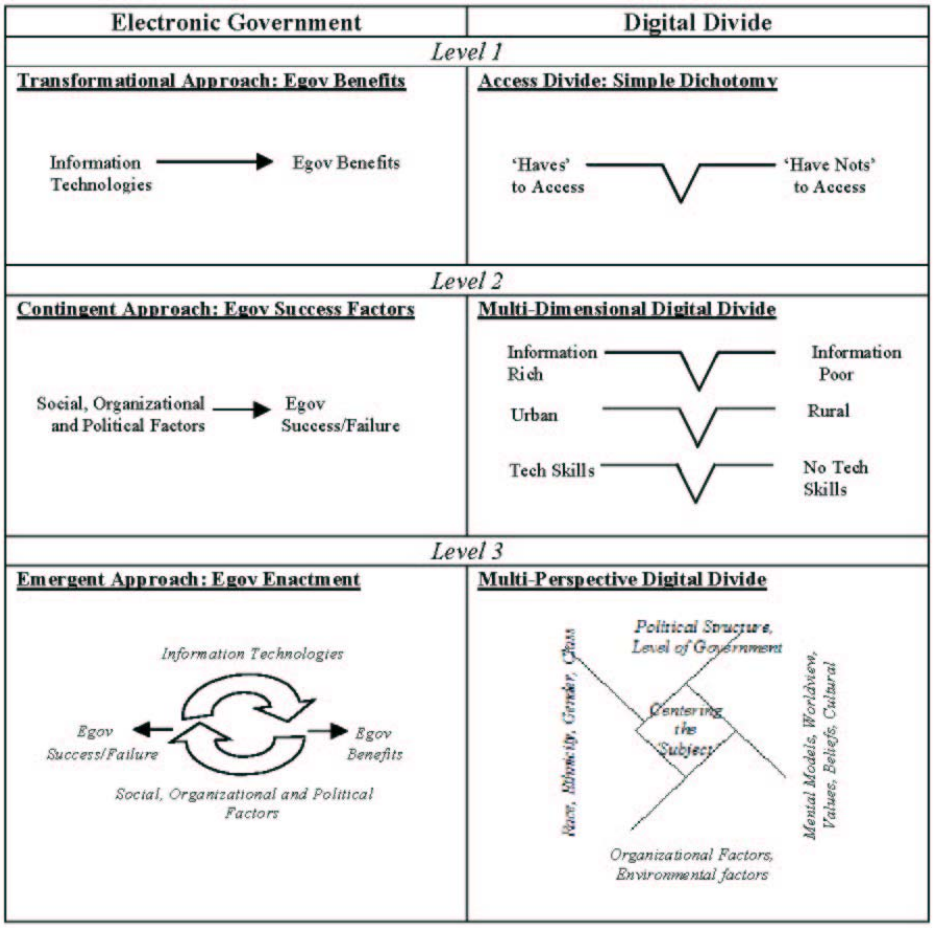

Figure 7. Electronic Government and Digital Divide Approaches

Level 1 shows the similar assumptions both fields have about the role of technology. Each approach in this level is similar to technological determinism, in which information technologies can solve social, political, economic, and organizational problems. From this view, information and communication technologies have the potential to improve government actions (e-government) and to eliminate virtual inequality (digital divide).

Level 2 speaks to the similar assumptions both fields have about the role environmental, social, political, and organizational factors have. For example, electronic government scholars try to isolate different causal factors that affect e-government initiatives' success or failure. For the digital divide, researchers look for different causal social and environmental factors which impact the digital divide and try to present multiple divide types in an attempt to reflect more accurately the scope of the phenomenon.

Level 3 reveals how each field has tried to capture the complexity of social phenomena. For example, recent e-government research has tried to describe the effects related to the recursive relationship between social, organizational, political and technical factors with respect to the success and failure of projects. Similarly, digital divide scholars have argued that the social, organizational, and political factors cannot be separated from their technical counterparts.

Implications for Research

E-government is a practice driven field, which is frequently optimistic about the outlook for the new "knowledge economy." Very often a managerial approach is adopted in e-government research and produces findings mainly useful for this social group. Society and politics, as a whole, is often not adequately addressed and the user (or individual) is only incorporated into stakeholder analyses and implementation strategies. Lamb and Kling (2003), however, recently encouraged a shift in research direction "from a user concept to a concept of the social actor in IS research." (p. 197). We argue that theoretical

models of e-government should include elements of the digital divide as an integral part of the analysis. In fact, e-government could be seen as the supply side and the digital divide could be seen as the demand side of the same social phenomenon. E-government researchers focus on initiatives that create electronic services for citizens, businesses and other stakeholders (supply). Digital divide scholars study how different social groups try to take advantage of these services and of the other uses for information and communication technologies (demand).

Accordingly, e-government research can follow Lamb and Kling's suggestion by learning from digital divide scholars about the intersections of race, class, gender and worldview with respect to technology and society. Digital divide research has clearly demonstrated that the "citizen" is not a homogenous group that exists "out there." The idea that we can serve all citizens with one system, or one type of application is sometimes not realistic. This suggests current or emergent theories of e-government would need to start asking, who benefits, how are different groups influenced, and what do they want from e-government? The goal in asking these questions is to create more comprehensive policies; but also, by looking at what people's needs and abilities are, the systems that are built may be used more. Theories that include all these elements would be more appropriate to understand how e-government and digital divide issues are interrelated.

In addition, both fields, e-government and the digital divide, are subject to government intervention. Therefore, it seems important that digital divide researchers take into consideration the managerial role government plays in strategy focus, development, and implementation of e-government and digital divide policies. Digital divide researchers can learn from the point of view of e-government scholars who focus on the "workings" of policy, technology, and management to create systems. E-government researchers often work in partnership or collaboration with government agencies and public managers. E-government researchers' knowledge of how policy and programs change and evolve within bureaucratic environments may be useful to digital divide scholars. In contrast, many times digital divide scholars work closely with users and learn about their preferences, capabilities, and interests. We think that this knowledge can be very useful for e-government researchers as well.

E-government researchers study a great variety of applications, including government-to-government (G2G), government-to-citizen (G2C), or government-to-business (G2B). In each area, the motive and ends for e-government are different and most likely; in these three areas e-government projects are conceptualized differently and the solution is different. Conversely, divide scholars tend to think more about the divides between citizens-to-citizens (C2C), but could potentially apply their theories and insight into other areas such as government-to-government (G2G) divides, or government-to-business (G2B) divides. Research resulting from the combination of these two streams of knowledge would be useful to understand complex inter-organizational settings in which information technology is used by multiple partners with different capabilities and interests.

In addition, we believe that the individual and society has not been fully incorporated in e-government research. We argue that the current "customer driven approach" associated with New Public Management has heavily influenced e-government goals; however, this "customer driven approach" should be different from the one used in the private sector. While private sector organizations account for the different preferences of customers, there is less regard for what effects these preference driven programs and products have on society as a whole (fairness and equity). A truly "public" management approach to e-government should account for all customers' possibilities and needs, but also consider important values such as equality, equity, and enforcement.

As mentioned before, in many cases, digital divide issues should be considered as important components in theoretical models, either as affecting the demand of e-government services, limiting the usefulness of certain government applications, or assessing the social desirability of information technologies in certain policy domains.

Implications for Practice

Understanding the intersections between electronic government and digital divide has also some important practical implications. Manuel Castells, in the preface to Servon (2002), describes how in developed countries the gaps between access, rural and urban, younger and older, are decreasing when education and income are controlled for. He contends that education, income, and the characteristics of technology are taking on more relevance than the earlier debates about access, and he states, "[diffusion] could lose relevance as a source of inequality for developed countries." He writes, "It is only by identifying the diversity and complexity of the digital divide that policies can be designed to over come it." (p. xviii) Similarly, for the case of e-government initiatives, Fountain (2001) offers the following description to set the tone. She writes,

> "These inequalities [between race, income, and education] must be considered in any political analysis of the use of the Internet in American government. The cases in this inquiry indicate that preferred 'customers' receive

> preferred treatment in government enactment of the Internet. If this happens throughout government, then enacting technology with a 'customer focus' and without conscious efforts to reduce inequality may exacerbate the digital divide in ways that extend beyond simple inequality of access." (p. 205)

In our opinion, Fountain suggests that public managers who do not take into consideration the particular perspectives' individuals embody will constrain or produce unintended consequences with respect to the effectiveness of e-government initiatives. Consequently, it could be argued that the digital divide shapes the choices and approaches of e-government. However, there is little empirical evidence to demonstrate the interplay between the two and future studies should address these issues (Garson, 2003a). In an attempt to partially address this gap, the following paragraphs highlight some important practical implications and areas that need more investigation and research.

We argue that addressing digital divide issues sheds light on the complexity of e-government initiatives and could help to improve the success rate of e-government project and policies. This new understanding can shape practitioners overall understanding of the situation and consequently, shape policy alternatives and potential interventions. At different levels of the bureaucratic hierarchy, practitioners have the ability to understand the digital divide and infuse this knowledge into agency strategic planning, project development, and policy implementation. Practitioners higher up in the hierarchy have the ability to incorporate understanding, but also to direct interventions and shape policy accordingly.

The following is a list of broad implications for practice based on our review of the digital divide literature and its applications to e-government. There are at least three areas where we feel that the implications for practice may have an impact on e-government initiatives.

Understanding Demand. Much of e-government research to date is concerned with the supply of services. The demand, for a full range of services, has not been investigated or understood to a similar extent by e-government researchers and practitioners. The digital divide literature focuses on studies about underserved populations and their relationships with technology and community. The basic tenets from this research field can be applied to a range of e-government areas including government-to-government, government-to-business, and government-to-citizen. Therefore, practitioners can learn from digital divide research to determine what is meaningful demand to different individuals. Comprehensive strategies for e-government should not only aim at bridging the offer related ones (e.g., PCs in schools or renewing a driver's license online) but need to also focus on demand related divides (or the differences among people in why, how, and when they use e-government programs). Since they have an indirect influence on the demand related gaps. Knowing and acting on digital divide issues can help increase the success of e-government initiatives.

Framing the Problem and Policy Alternatives. Public managers' assumptions about e-government and the digital divide will have an impact on the way problems are defined and the technological, social and organizational alternatives and solutions are elaborated (Kling, 1978). While e-government research has made progress toward understanding the recursive nature of organizations, individuals and technology and how users in different contexts enact technology differently; e-government research has not progressed in theorizing the social nature of the individual and the public managers in those contexts.

Policy scholars contend that "symbolic naming of a social problem," such as the 'digital divide', is a central component in the process of public policy problem definition (Stone, 2002). Digital divide scholars, especially those aligning themselves with Level 3 in Figure 7, believe that the term 'digital divide' is all together problematic. They contend that it carries with it a general misconception, portrayed in the media and in policy, that the *only* problem is 'access to technology'. For example, an instance of problem framing follows. When policy debates and projects continue to use the broad term 'digital divide' the terms of the debate are shaped by the meaning of the symbolic name; for example, those who have access and those who do not. However, when analyzing access availability (i.e., DSL coverage) between rural and urban users or analyzing access availability (i.e., DSL coverage) between different races, the problem definition shifts from a simple access problem to a geographical access or socioeconomic access divide. The ways different political influences maneuver policy frames during the process, shapes alternatives and constrains identifiable solutions. Digital divide scholars have opened up ways to perceive 'the problem' differently and e-government researchers can apply this different conceptual lens to strategically address areas of policy and programmatic change.

For instance, public managers can extend popular stakeholder analysis tools by making explicit not only managers' interests, or those involved in e-government projects, but also make explicit how the problem definition was framed by public managers. For certain e-government initiatives, one should ask, what are the assumptions of stakeholders and public managers? The more successful e-government projects are in addressing the varying needs of citizens

from many different perspectives can only strengthen the likelihood that the e-government applications will be used and embraced. The studies and insights from the digital divide literature can be used in the project management of e-government projects in a variety of different stages. For example, incorporating research in needs analyses.

Creating, implementing and evaluating policies and programs. Strategic vision plays an important role in coordinating and aggregating supply and demand**.** E-government is not just about designing smart IT policies or functional systems (albeit these are both very important), it is also about coordination between the many projects that go on at all levels of government and society, because these all impact demand. Therefore, policies and projects need some type of coordination effort in order to reach a critical mass that reflect meaningful demand.

Public managers need to communicate and coordinate macro strategies and local strategies, in addition to the thinking through the short-term and long-term consequences and benefits of e-government projects and policy development among different communities. The evaluation of two well-known policy solutions in the US demonstrates unintended effects with respect to the policies' overall impacts on projects and programs. For instance, the E-rate program in the US has wired almost all public libraries and schools, but the negative side shows that school districts are dependent on the funding, and the policy has produced disincentives to undertake collaborative projects (Servon, 2002). Another example are Community Technology Centers (CTCs) in the US. CTCs bring the Internet to community centers, regardless of the socioeconomic status of neighborhoods, and while parts of the access gap have closed, other gaps have become more salient. The new gap identified is described as a gap between suburban and urban CTCs' solvency, level of advanced technologies used, technological literacy promoted and training emphasis (Servon, 2002).

Considering e-government initiatives and the digital divide as complementary may result in a better understanding of the overall situation and work to create specific strategies accordingly. In addition, this may affect the ways e-government programs are evaluated, tested, and implemented.

CONCLUDING REMARKS

The goal of improving service quality was found in all the e-government policy statements examined in a recent international study (OCDE, 2003). Customer-orientation is one of the most prevalent ways in which governments have attempted to improve the quality of the services they provide to businesses and people. E-government initiatives do have the potential to deliver better services. However, some problems of access and use diminish this potential (Garson, 2004). Scholars from different disciplines argue that there are many social groups that cannot enjoy the benefits of electronic services, or that cannot meaningfully obtain value from them (Mariscal, 2003; Mossberger et al., 2003; Norris, 2001; Warschauer, 2003). Some researchers suggest that e-government is related to the digital divide mainly through economic development (Castells, 2000; Cresswell, Dawes, & Pardo, 2001). Others think that inequality problems can be solved using multiple channels for delivering public services. For instance, Canada's multi-channel approach is an attempt to deal with differences in access, preference, or income among citizens (D'Auray, 2003). We argue that e-government and the digital divide should be seen as complementary social phenomena (i.e., demand and supply). At this point research and practice in these two areas seem to be disjointed and few explicit intersections can be found. For research, a more integrative approach can help to understand the complex and recursive relationships between e-government and the digital divide. For practice, this new understanding has the potential to create a more comprehensive strategy that takes into consideration the alignment of e-government initiatives and digital divide policies such as access, education, and identification of individual needs.

The conceptualization of the digital divide has important implications from a policy maker point of view. The effectiveness of policies implemented will depend to a large extent on the accuracy of the mental models adopted by public managers. The digital divide should be considered the sum total of a number of demand and offer related gaps and that its determinants may vary across geographical areas and other variables (Ferro, 2005). This suggests that policies aimed at reducing the digital divide, should consider the specific type of gap they are aiming to bridge and the multiple perspectives carried with them. Moreover, preliminary studies should be conducted in order to understand the specificities of the divide present in an area in which e-government initiatives will be implemented. Virtual inequality can be a limiting factor in certain e-government projects and policies. A more comprehensive view of e-government policies, one that takes into consideration supply and demand, can potentially increase the expected positive impacts of electronic government in society.

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