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A Preliminary Assessment of the Development of e-Government in a Local Government in Peru[1]

Martin Santana[†]

Abstract In recent years, there has been a rapid increase in the implementation of electronic government initiatives at different levels of government in the world. Much research on e-government has suggested that e-government projects not only improve access to, and satisfaction with, public services, but also enable development opportunities available to individuals and groups through information and communication technologies (ICT). Generally, the findings of this stream of research are contradictory and the empirical evidence supporting competing viewpoints is overwhelming. A plausible explanation for these equivocal results is that most implementation studies have overlooked the ways responsible actors manage e-government implementation processes. In particular, very few attempts have been made toward identifying and classifying general types of e-government technologies. To this end, a case study of a local government in Peru was conducted to investigate the implementation of e-government technologies over a 10-year period. Overall, the results highlight the importance of two general types of e-government technologies, namely e-services applications and digital inclusion solutions. The results also indicate the existence of several critical factors that contribute to successful e-government implementation. Based on these findings, this study concludes by suggesting future research directions for e-government.

1. Introduction

Since the early-1990s, the government of Peru has made a serious commitment to supporting governance reform in an effort to reduce public expenditure and increase transparency. As a result, a diversity of ICT-based projects has been launched under a national plan of modernization of public administration (INEI, 2000). Generally, these electronic government (or e-government) technologies have played a key role in improving access to quality public services (CODESI, 2005).

The research literature on e-government is diverse and contains numerous conceptual definitions (see Yildiz, 2007). The concept of e-government generally refers to the use of ICT to deliver better, more efficient public services, to improve citizen participation in democratic processes, and to decrease digital inequality (Backus, 2001; Becker et al., 2008; Heeks and Bailur, 2006; Olphert and Damodaran, 2007).

The benefits of e-government in Peru are numerous. In particular, there has been increased access to public services and greater efficiency of public sector operations. However, deficient functional usage of e-government technologies tends to remain high

[†] Professor, ESAN University, Peru, and Japan Foundation Fellow, Institute of Asia-Pacific Studies, Waseda University

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(CODESI, 2007). Moreover, the digital divide between the privileged and non-privileged groups remains unchanged. As such, digital inequality in Peru continues to remain very wide and in many cases getting wider (INEI, 2008).

There exists general agreement in the literature on information technology (IT) that the existence of a digital divide, i.e., the gap between those who have access to ICT ("haves") and those without access ("have nots"), is often associated with an impediment to the social, cultural and economic development of individuals and groups (Dewan and Riggins, 2005).

This study is an effort toward understanding the ways in which local governments attempt to bridge the digital divide as it focuses on the implementation of a variety of e-government technologies over a 10-year period, all of which have served to mitigate some of the digital inequalities in the district of Miraflores in Lima, Peru. Specifically, this study focuses on two general types of technologies that public officials follow to guide the development of e-government, and in particular on several critical factors that contribute to successful e-government implementation.

The case study of Miraflores is worthwhile as it provides insights into the evolution of e-government efforts undertaken by a local government of a developing country that has exhibited one of the fastest economic growths in Latin America for a decade, and thereby has the opportunity to bringing about digital equality.

The remainder of this article is organized as follows. In Section 2, relevant literature on e-government development, digital equality and inclusive e-government is reviewed. In Section 3, the research methodology is described along with key characteristics related to the research setting. This also includes background information on e-government at national level in Peru. Section 4 presents the observed results pertaining to two general types of e-government technologies-e-services applications and digital inclusion solutions. In Section 5, the results are discussed. Section 6 summarizes the limitations of the present study. Finally, Section 7 concludes by suggesting future research directions for e-government.

2. Literature Review

Development of e-Government

The literature on e-government is replete with conceptualizations and models of the development of e-government (Andersen and Henriksen, 2006; Backus, 2001; Coursey and Norris, 2008; Layne and Lee, 2001). These models generally include four distinctly stages referred to using many diverse labels, including *information or catalogue stage*, related to an initial presence on the Internet to improve the delivery of public information; *interaction or transaction stage*, which involves a two-way communication between government and citizens through functions like downloading forms, e-mailing to public officials, and supporting various public services such as collecting taxes and getting driver licenses or national identification cards; *vertical integration stage*, related to efforts made to integrate public information and service delivery from lower to higher levels of government; and *horizontal integration or transformation stage*, which refers to fundamental changes in governmental structures and public sector operations to achieve greater effectiveness of public services. Regardless of the label used, the general development of e-government can be thought of as progressive or successive stages of

growth.

Previous studies on this stream of research have paid little attention to the identification and classification of various technologies that are being used in each stage of the development of e-government. As such, to date very few attempts have been made to develop typologies of e-government technologies and public officials still lack the required knowledge to address the long-standing high failure rate of most e-government projects (Heeks, 2003).

This study proposes that e-government technologies can be broadly classified into two general types, namely *e-services applications* and *digital inclusion solutions*. E-services applications were first introduced in the early-1990s to improve the activities of public sector organizations and facilitate the dissemination of public information. Some examples are the so-called "back-end" and "front-end" applications, information kiosks, and Web portals (Madon, 2006). Typical public services provided through e-services applications include payment of income and property taxes, license applications, motor vehicle registrations, submitting forms for permits and certificates, issuance of visa and passports, and procurement of supplies and products.

Digital inclusion solutions introduced from the late-1990s, on the other hand, are more comprehensive initiatives to addressing the complex aspects of digital equality including universal access to ICT and computer literacy (Backus, 2001). These include, for example, community technology centers, computer training and other capacity building initiatives.

This study argues that a number of contextual conditions facilitate and constrain the usage of these general types of e-government technologies. Generally, it is expected that e-services applications will be implemented at the basic stages of the development of e-government and digital inclusion solutions at the final and most sophisticated stages of growth.

In the following subsection, research addressing digital equality and its linkage with inclusive e-government is reviewed.

Digital Equality and Inclusive e-Government

The growing acceptance of a deepening of the digital divide in different regions of the world has led governments at different levels to pursue broader initiatives to bridging the divide and ensuring that no citizen is left out of the benefits of the information society (Kvasny and Keil, 2006; Sipior et al., 2004). For instance, in an extensive review of the literature on the digital divide, Dewan and Riggins (2005) discuss two important social consequences of the digital divide: inequality in access to ICT (first order effects), and inequality in the ability to use ICT (second order effects). Among other things, the authors suggest that much more research is needed at the individual, organizational and global levels of analysis toward understanding the role of governments in overcoming some of the key barriers to digital equality. Generally defined, digital equality can be viewed as the processes by which governments create equal opportunities for participation of all in the economic and social benefits of the information society (WSIS, 2003).

While studies of the digital divide have made a positive contribution to our understanding of digital equality, the literature still abounds with cases describing the

emergence of new divides that can affect a large range of individuals and groups, particularly those living in less-favored areas (or *geographical digital divide*) or vulnerable due to specific conditions including age (or *e-ageing*), lack of IT skills (or *e-competences*), physical disabilities (or *e-accessibility*), and cultural attitudes (or *cultural e-inclusion*).

To complement our current knowledge of digital equality, several researchers have proposed to focus in much greater depth on the needs of digitally and socially disadvantaged groups. For example, Molina (2003) proposes the formation of a global digital inclusion movement as a necessity and not as an option to achieving the United Nations' Millennium Development Goal of reducing poverty by half by 2015. In a similar manner, the 2006 Riga Ministerial Conference on ICT describes a set of public policy goals and priorities to convincingly achieve an inclusive information society aimed at maximizing benefits for all segments of the population in Europe (EU Ministerial Declaration, 2006).

To this end, various factors have been proposed for achieving digital equality. For instance, in a longitudinal study with almost 1,000 adults of age 55 or older in Hong Kong, Lam and Lee (2006) claim that inequalities in ICT usage among older adults can be diminished by offering tailor-made computer training aimed at boosting motivation and self-confidence. The authors conclude that social programs designed to improve the quality of life of the elderly or other socially disadvantaged groups should not neglect the role of appropriate computer training.

Huerta and Sandoval-Almazan (2007) report results of a case study conducted on users of *telecenters* (i.e., community technology centers) from marginalized populations in Mexico. The results indicate that digital illiteracy, particularly lack of branching, reproduction, and information abilities, is an impediment to use the Internet and to assess the quality of the information retrieved. It was also noted that the lack of English proficiency and some technological barriers, such as Internet access speed, are key barriers to digital equality.

The relationship between digital equality and inclusive e-government has also been acknowledged. Simply stated, inclusive e-government refers to improving the delivery of public services in a manner to strengthen democracy and encourage citizen participation (EU Ministerial Declaration, 2006). One of the earliest attempts to investigate the linkage between digital equality and inclusive e-government was a study by Mahrer and Krimmer (2005). Using multiple case studies on Austrian federal and provincial parliaments, Mahrer and Krimmer concluded that (p. 34): "The so-called digital divide was seen as the main driver for unequal conditions in the consequent ability to access public services. So in the end, measures to counteract the digital divide were recommended, and measures promoting e-democracy were declined."

Other related studies have directed attention to a diversity of issues regarding digital democracy, i.e., the use of ICT to enabling citizen engagement in public decision and policy-making processes (Macintosh, 2004). Digital democracy has been frequently conceptualized in terms of two distinct dimensions called online voting and digital participation. While online voting is defined as new ways of enabling formal voting through ICT, digital participation generally refers to the opportunities for enabling citizens to become active participants in different activities of governance.

Medaglia (2007a) suggests that most studies of digital participation are still descriptive in nature and lack theoretical grounding and use of a common set of key concepts, conceptual frameworks and instruments. The author concludes that much research on digital participation is still very fragmented and in search of building a shared body of literature. He suggests the need for further theoretically grounded contributions regarding conceptual clarification.

A noteworthy attempt to examine inclusive e-government based on a theoretical perspective is the study by Olphert and Damodaran (2007), who draw upon Mumford's theory of socio-technical systems. They make use of data from 20 case studies on citizen participation from countries across the world to conclude that most e-government initiatives fall short of their objectives of achieving wider citizen engagement in decision making and policy making. In particular, the authors suggest that implementing e-government technologies based on socio-technical paradigms that put emphasis on citizen participation throughout the process offers the key to achieving digital equality.

Medaglia (2007b) offers a study that examines digital participation at local level. He conducted a survey on three categories of online features-information, consultation and participation-offered by the Web portals of 113 main municipalities in Italy. The study finds that digital participation features in e-government applications are affected by a number of factors that are non-technical in nature. Among these, contextual factors such as the size, wealth, and political orientation of the local governments are critical to ensuring the success of e-government implementation.

In a similar manner, Jain and Kesar (2008) examine digital participation at local level in the UK. Using a case study method, the authors investigate the factors that contribute to successful e-government implementation. Particularly, they highlight the importance of meaningful citizen engagement with e-government technologies in order to create awareness about the value of e-government services.

Recently, in an analysis of inclusive e-government, Becker et al. (2008) explore e-government usage by four socially disadvantaged groups in Germany: senior citizens of age 55 to 74; citizens with low education; citizens living in thinly populated areas; and unemployed citizens. Overall, the results suggest that 18% of the population make use of informational, but not transactional e-government services due to a variety of reasons, including service complexity, data security and costs. These findings lead the authors to highlight the strong link between social and digital exclusion. Specifically, they propose that citizen-centric approaches should be employed to achieve digital equality in the use of e-government technologies.

3. Methodology

This research follows a qualitative approach based on the single case study method (Yin, 2003). The case study for this research is a specific local government in Lima, Peru. The study focuses mainly on the adoption of e-government initiatives over the 10-year period of 1996–2006.

Semi-structured interviews and informal discussions were primarily used to collect relevant actors' roles and perceptions of the previously introduced e-government initiatives. 13 interviews were conducted involving altogether 9 interviewees, who partici-

pated in the e-government projects including the mayor (1), IT director (1), project managers (2), government personnel (3), and operational staff (2).

The interviews were conducted by a two-person research team, with one researcher serving as the interviewer, while the other conducted extensive note taking and tape-recording. Depending on the participants' consent, the interviews were tape-recorded and transcribed immediately after the meetings. The interviews lasted an average of 1 to 1.5 hours.

The interviews were complemented with direct observation and secondary data such as technical documents, meeting minutes, publicity materials and websites. Data triangulation was particularly appropriate for this research because it allowed to adding richness to the interview findings and ensuring reliability and increased validity of the data collected (Creswell, 2003).

Research Setting

The setting for this study is the local government of Miraflores in Lima, the capital of Peru. Miraflores is one of the most attractive commercial neighborhoods out of 43 districts in Lima, all of which are fused together in a continuous city of Lima with approximately 8.5 million people according to the 2007 census (INEI, 2007). With a total land area of 9.62 km^2 and a population of 87,000, the district of Miraflores is divided into 14 zones and 39 subareas that concentrate numerous tourist attractions and entertainment venues.

The local government of Miraflores (hereafter referred to as LGM) is elected and composed of a mayor and a city council that serve for a four-year term. Overall, LGM plans city development, executes public investment projects, promotes economic activities and manages public property.

The value of using LGM as an appropriate research setting to investigate e-government implementation has been established by Rodriguez and Santana (2006), who investigate the way in which ICT are being leveraged to help the citizens of Miraflores since the mid-1990s. To this end, LGM has undertaken the implementation of a variety of e-government technologies to improve the provision of public services to both citizens and businesses. Particularly, LGM is considered as one of the few local governments in Peru that is committed to introduce a wider choice of public services to all.

The following section presents a brief overview of the evolution of e-government in Peru in order to provide background information for the LGM case study.

Contextual Background

Since the first Alberto Fujimori's administration (1990–1995), Peru decided to encourage the use of ICT in public administration under a national plan of modernization initially developed by the National Statistics and Information Technology Institute (INEI, 2000). However, it is with Alejandro Toledo's government (2001–2006) that several e-government technologies were first introduced in public administration to improve access to, and satisfaction with, public services. During his administration, Toledo also strengthened the country's economy through the implementation of structural reforms and sound fiscal and monetary policies. So far, the current Alan Garcia's

administration (2006–2011) remains committed to preserve macroeconomic stability and promote sustainable and equitable growth.

As a result of this shared economic orientation in Peru's administrations over the past decades, the nation's economic performance is being sustained on the back of strong export growth, fiscal surpluses at record-high levels, and upbeat domestic demand (International Monetary Fund, 2008). In recent years, real GDP grew 7.6% in 2006, 9.0% in 2007, and 9.4% in 2008. Estimate for real GDP growth is 6.0% for 2009.

The initial stage of evolution of e-government in Peru can be described as a rudimentary Internet presence in the mid-1990s. At this time, most efforts were directed toward developing Web portals to give citizens and businesses access to public information. This informational presence was followed by a transactional stage in which citizens and businesses were able to carry out a few transactions with key national government agencies like the Tax Administration Authority (SUNAT), the National Superintendency of Public Registries (SUNARP) and the National Identification and Civil Status Registry (RENIEC).

The launch of a government portal (http://www.peru.gob.pe) in 2001 was an important element of the strategy for e-government in Peru. This portal formed part of a national effort to increase public sector productivity and thus, make government more responsive. All national government agencies were mandated to provide through this portal a single point of entry to public information related to plans, budgets, regulations, and purchasing.

In 2002, the government of Peru enacted a critical law to ensure transparency and improved access to public information (Congress of Peru, 2002). By 2003, it created a new unit under the Office of the Chairman of the Council of Ministers called *ONGEI-National e-Government and Information Technology Office*. The overall mission of this unit was to coordinate and support all kind of efforts undertaken by national government agencies to increase access to public services through e-government technologies (CODESI, 2007). As such, there is now growing acceptance of e-government technologies at various levels of government in Peru (national, regional and local) as key means to providing improved quality of public services (ONGEI, 2006).

4. Case Findings

To assist in the discussion of the results, the interview data is reported by presenting evidence in the form of specific examples of e-government technologies and quotations gathered through data collection. Particularly, e-government technologies are described according to the two general types discussed in an earlier section.

e-Services Applications

Since the mid-1990s, LGM has implemented various e-services applications to enable informational and transactional public services. One of the earliest applications introduced in 1996 is an integrated administrative system to support the dissemination of public information. The findings indicate that this system mainly supports project management activities and provides relevant information related to administrative costs and procurement.

As ICT level of usage grew in popularity during the early-2000s, LGM engaged in

efforts to streamline inefficient processes of individual departments. As such, a broad range of back-end applications was implemented to enhance both the integration of public services across the majority of functions of LGM and the sharing of information with other government agencies. Examples include municipal tax systems, land and property systems, and Geographical Information Systems (GIS) technology to map out areas for planning and zoning activities within the district.

The next stage of development of e-government at LGM is characterized by the launching of an official municipal portal (http://www.miraflores.gob.pe) in 2003. This portal serves as one single gateway access to public information and integrated service delivery. Some public services that can be fully performed through the portal include issuance of certificates, collection of payments and taxes, permission applications and licenses, procurement information and legal and medical consultations. The results reveal that the municipal portal is one of the pillars of e-government at LGM. By 2006, the investment in the portal had reached $500,000 and received more than 1,200 unique visitors per day. However, it has supported the administration and collection of bills and taxes of only 5% of the total annual revenues for LGM.

More recently, LGM has made efforts to implement a number of front-end applications to improve the interactions between government and citizens and businesses. These applications facilitate the execution of transactions from one simple Web interface, which usually helps to personalize the provision of desired public services. The results show that the implementation of front-end applications represents an attempt to refine customer service and evolve gradually toward a fully functional framework for e-government services.

Digital Inclusion Solutions

Despite the potential direct and indirect benefits that e-services applications afforded to citizens and business, the results reveal that their general level of usage was relatively disappointed. The main reason appears to be not only the low level of Internet penetration in Peru (9.7% in 2000 according to Internet World Stats, 2008), but also the limited general IT skills among citizens of Miraflores. To overcome these barriers, a digital inclusion plan was formulated in 2003 with the following aim:

> "[LGM] is committed to promote an inclusive information society through the delivery of efficient, cost effective and transparent public services online, thus allowing the transformation of the relationships with citizens and the reduction of the digital divide in the community."

Central to the execution of this strategy was the launching of the MIRA-net initiative, which creates a network of community technology centers to make ICT accessible to everyone. In these centers, citizens can have access to and make regular use of the Internet and also participate in training opportunities to develop the basic IT skills required to take advantage of the benefits of ICT. Generally, the MIRA-net initiative promotes digital literacy skills through structured educational programs, facilitates adult learning and assists local small businesses. The results show that the most demanded services include computer tutorials, software training, and courses

covering the Internet and its applications. The strong interest in the MIRA-net initiative is emphasized by a high degree of use by 50,000 residents, mostly elderly and those on low incomes, during the first year of operation of the community technology centers (El Comercio Peru, 2006). As explained by the mayor:

> "The goal of developing targeted training programs was to bridge the specific generational digital divide, which is recognized as one of the most significant barriers in Miraflores in view of the high percentage of elderly in our community."

In recent years, LGM has set up a number of other digital inclusion solutions. For instance, for the first time in Latin America in May 2004, LGM held a general election to fill vacant positions using Internet as one of the primary channels for voting. This online voting experience has been successfully repeated over the next years, with noticeable increases in the average use of Internet by citizens, thereby producing an increase in total municipal polls (Municipalidad de Miraflores, 2008a; 2008b).

LGM has also implemented a solution to broadcast on the Internet the Municipal Council meetings (http://www.miraflores.gob.pe/sesiones.asp). This Internet solution- which is easy-to-operate and low-cost- provides information about any activities which are pursued by LGM. At the same time, it enables the posting of questions by citizens and the transparent presentation of answers to these questions by public officials. The findings indicate that this solution plays an important role in making citizens better informed about government plans or decisions and public officials more accountable for their actions. Moreover, there is consensus in terms that the direct Internet broadcasting is essential not only to make government more transparent and responsive, but also to contribute to enhanced interaction with public services, thereby ensuring wider digital equality.

5. Discussion

The findings reveal that the typical e-services applications of any e-government initiative are commonly supplemented by digital inclusion solutions to promote more interaction with citizens, particularly for those with greater social needs. The evolution of the use of different e-government technologies at LGM is in agreement with the normative literature on e-government development discussed in an earlier section. In particular, the adoption of back-end and front-end applications at the basic stages of e-government is in line with the findings by Janssen and Cresswell (2005), who use a simulation-based approach to discuss the benefits and implications of using enterprise systems in e-government. This conclusion is similar to that drawn by Madon (2006), who describe the evolution of e-government in the Indian state of Gujarat over a 17-year period.

On the other hand, the results also suggest that as efforts progressed toward the next stages of e-government development at LGM, the focus began to shift from optimizing operational efficiency to motivating previously excluded citizens. The MIRA-net initiative was identified as the element necessary for using e-government services effectively by addressing the digital divide issues of universal access and basic computer training. The targeted ICT training was successful in focusing on the needs

of specific socially disadvantaged groups such as elderly residents and low-income individuals.

Although there are not available figures on how people in different demographic profiles use the Internet in Miraflores, a recent report based on data gathered in the first trimester of 2008 found that 75% of Peruvians use public Internet facilities, while only 16.9% of householders have access to the Internet, compared with 41.9% in Lima (INEI, 2008). This is not surprising considering that Peru pioneered the concept of *cabinas públicas* (Internet cafes) in Latin America in the 1990s and still remains as a world leader in terms of Internet usage in public places. As such, this study proposes that community technology centers should be viewed as an essential part of any digital inclusion initiative in Peru.

From the findings, it becomes apparent that a main goal of the other digital inclusion solutions-online voting and Internet broadcasting solution-was not to find simple mechanisms to handle different forms of democratic practice, but new ways for improving citizen participation in political and administrative plans and decisions. Both solutions enable citizens to become involved in existing government initiatives and to influence public decision-making. Particularly, the results suggest greater participation of citizens in elections both via the Internet and via traditional channels. This is consistent with findings by Svensson and Leenes (2003) regarding the introduction of online voting in 13 European countries.

Despite the apparent lack of knowledge of e-government at local level to be learned from in the mid-1990s, the findings suggest that LGM has accomplished much through the implementation of a broad range of e-government technologies. In speaking with citizens of Miraflores regarding their expectations of e-government, the discussions revealed that most of them felt proud about how LGM addressed some of the key barriers to digital equality, and some were relatively satisfied with the quality of e-government services provided in terms of service availability, importance of services offered, and fairness of service delivery.

This has implications for e-government implementation encouraging a move from a vision on greater public service efficiency to better ways of engaging citizens with their governments. Reducing digital inequality clearly presents huge challenges that are not always easy to overcome, particularly for many local governments. However, this study found some empirical evidence suggesting that making the shift to digital inclusion solutions helps not only to meet the needs of citizens regarding service delivery, but also to encourage greater participation in governance as part of reducing digital inequality. This conclusion endorses Jain and Kesar (2008), who argue that inclusive e-government projects appear to enjoy the highest levels of success.

Previous studies have suggested that e-government assessment can be viewed through the ability of governments to create different aspects of public value such as collaborative agreements for service delivery, outcomes evaluation, and trust among partners (Castelnovo and Simonetta, 2007). In a review of the literature on e-government success factors, Gil-Garcia and Pardo (2005, p. 193) note:

> "[e-Government] success is not only about selecting the right technology, but also about managing organizational capabilities, regulatory constraints, and environ-

mental pressures. For e-government managers to be successful in their initiatives they must be aware of these challenges and use appropriate strategies to overcome them."

The challenges to e-government stem not only from gaining agreements that it is necessary, but also from engaging the necessary partners in the implementation of e-government technologies. In this study, developing strategic public-private partnerships (PPP) was found to be critical to the success of e-government technologies at LGM. Partners included multinational and local companies alike, which largely focused on building a sound ICT infrastructure to provide broadband WiFi Internet access at no cost in public facilities. The results suggest that to achieve this aim, LGM lobbied private project partners about the potential benefits of e-government to them. Interestingly, Miraflores turned into the first wireless city in Peru by September 2005 with heavily support of the former Chairman of the Board of Intel Corporation, Craig R. Barrett.

The support of the private sector for launching e-government technologies involves identifying relevant partners and getting them involved in the development process. It is common practice for governments to develop innovative PPP financing schemes to facilitate the contract negotiations between the parties. Generally, the long period of concession contract presents additional challenges to the use of PPP in e-government (Roy, 2003). Therefore, it is important to make informed decisions on the introduction of private sector partnerships into e-government.

The findings also shed light on other related e-government success factors. First, the political will of improving the quality of public services was identified as an important factor in the evolution of e-government at LGM. Particularly, the role played by the major in championing the e-government technologies at LGM is recognized as highly important. The findings suggest that the mayor was a leading advocate for ensuring the progress of e-government projects. More precisely, the mayor's support and involvement in the planning, development and implementation processes was an important social influence for all members directly involved in e-government projects. This is consistent with a substantial body of the literature on the role of management championship in encouraging implementation of ICT in general (Purvis, Sambamurthy, and Zmud, 2001), and e-government in particular (Mahler and Regan, 2003).

Implementing e-government technologies on the basis of incremental, short-term projects that produce some fairly quick and measurable deliverables was identified as other e-government success factor. Due to the particularities of one-year budgets in local governments, this type of evolving development process can be viewed as a powerful means to successfully implementing e-government. As in the case of LGM, previous studies have proposed that an incremental approach increases the rate of project success by creating awareness about the value of e-government and making stakeholders participate actively in the projects (Jain and Kesar, 2008; Olphert and Damodaran, 2007).

Finally, developing an overall strategy was also found to be critical to the success of e-government implementation. A strategic direction can be seen as an umbrella for establishing clear and realistic goals of how e-government will progress to the final

stages of e-government development. It is interesting to note that the mayor of Miraflores won re-election at the Municipal 2002 Election with the campaign slogan "Internet for citizen communication and participation." In this study, a digital inclusion strategy was essential to establish a set of goals and priority issues to adapting e-government technologies to the specific conditions of low Internet use by citizens of Miraflores. As discussed above, one key element of this strategy was the launching of various digital inclusion solutions to overcome some of the key barriers to digital equality. Among other things, developing an adequate strategy for e-government requires to take into account a balanced combination of both e-services applications and digital inclusion solutions. In this regard, past research on IT implementation provides considerable evidence on the importance of formulating a comprehensive strategy for implementing ICT-based projects in organizations. (See Oh and Pinsonneault (2007) for recent work in this area).

6. Limitations

Because this research is based on a single case study, it suffers from the usual limitations of generalization of the results. Future studies that involve multiple case studies in comparable municipalities are clearly needed to establish a shared set of best practices for successful implementation of e-government and to generalize the findings to other local governments. The empirical evidence provided by this study is a starting point in such direction.

Another limitation of this study is that the data collected is based primarily on interviewees' recollections of their actions and events during e-government projects. As such, it is uncertain whether their perceptions reflect general information on only successful projects, but not on those considered as failures. This needs to be investigated with different research methods, particularly mixed approaches which capture qualitative and quantitative data about the entire development process through numerous iterations.

7. Conclusion and Future Research Directions

This study explores the development of e-government in a local government of a developing country. The results reveal that the implementation of general types of e-government technologies requires addressing inequalities beyond technological barriers. Particularly, it involves focusing on opportunities for improving the general IT skills to reduce digital illiteracy, and thereby deliver public services in a more equitable manner. A great deal of research on the digital divide has provided insight into the social and economic consequences of the inequalities in access to and use of ICT. However, much research is needed regarding the existence of differences in the accessibility and usage of e-government services, particularly among socially vulnerable individuals and groups. Further measurement and analysis of e-government efforts undertaken by different levels of government in the world are needed to augment our understanding of digital equality.

Similar to past research on e-government (e.g., Becker et al., 2008; Jain and Kesar, 2008), this study found that a range of complementary projects are necessary not only for enabling informational and transactional e-government services (e-services applica-

tions), but also for promoting public-consultation activities and dialogues between government and citizens (digital inclusion solutions). It has been suggested that ensuring citizen participation in the design of any e-government application is crucial for its successful implementation (Olphert and Damodaran, 2007). Consequently, a challenge for public-officials is to adhere to a citizen-centric approach to implementing inclusive e-government. Further research attention is needed in this area to examine the impact of citizen engagement on the design, development and implementation processes of e-government technologies. This is especially important now due to the mushrooming of capacity building programs for empowering citizens to participate in public decision and policy-making processes.

It is also important to establish solid partnerships between governments and private businesses to secure the progress of e-government technologies. The findings indicate that the use of PPP was one of the critical success factors of e-government at LGM. Despite the fact that any e-government project is expected to count on the support of private sector partners, it is not clear how PPP are critical in combating digital inequality (Roy, 2003). Understanding the implications of PPP projects is a worthwhile area of research to extend our current knowledge of e-government.

In closing, it is clear that digital equality encompasses a diversity of technological, social, economic, and public policy issues, all of which present huge challenges that go beyond the efforts of any local government. Even though this study provides empirical evidence that suggests ways of mitigating some of the inequalities in the usage of e-government in a manner to reach socially excluded groups.

References

Andersen, K. V., and Henriksen, H. Z. (2006). "E-government maturity models: Extension of the Layne and Lee model," *Government Information Quarterly*, 23, 236–248.

Backus, M. (2001). "E-governance in developing countries," *International Institute for Communication and Development (IICD)*, Research Brief No. 1. Available at http://www.ftpiicd.org/files/research/briefs/brief1.doc, last accessed on 09/09/08.

Becker, J., Bergener, P., Niehaves, B., and Räckers, M. (2008). "Social inclusiveness of electronic public service delivery in Germany—A quantitative analysis," *Proceedings of the 14th Americas Conference on Information Systems*, Toronto, Canada, 1–9.

Castelnovo, W., and Simonetta, M. (2007). "The evaluation of e-government projects for small local government organisations," *The Electronic Journal of E-Government*, (5 : 1), 21–28.

CODESI. (2005). *Plan de desarrollo de la sociedad de la información en el Perú—La agenda digital peruana.* CODESI—Multisectorial Commission of Monitoring and Assessment of the Information Society Development in Peru. Available at http://www.codesi.gob.pe, last accessed on 10/15/08.

CODESI. (2007). *Informe de la ONGEI a CODESI sobre la implementación de la estrategia nacional de gobierno electrónico en el año 2007.* CODESI—Multisectorial Commission of Monitoring and Assessment of the Information Society Development in Peru. Available at http://www.codesi.gob.pe/codesi/PopUp/DS-031-2006-PCM.htm, last accessed on 09/16/08.

Congress of Peru. (2002). Law 27806—*Ley de transparencia y acceso a la información pública.* Available at http://www.congreso.gob.pe/ntley/Imagenes/Leyes/27806.pdf, last accessed on 10/15/08.

Coursey, D., and Norris, D. F. (2008). "Models of e-government: Are they correct? An empirical assessment," *Public Administration* Review, 523–536.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd Ed.). Sage Publications, Thousand Oaks, CA, USA.

Dewan, S., and Riggins, F. J. (2005). "The digital divide: Current and future research directions," *Journal of the*

Association for Information Systems, (6: 12), 298–337.

El Comercio Peru. (2006). "Abuelitos cibernéticos," Available at http://www.elcomercioperu.com.pe/edicionimpresa/html/2006%2D06%2D30/imphogar0532734.html, last accessed on 10/15/08.

EU Ministerial Declaration. (2006). "EU ministerial declaration on e-inclusion," *I-Ways, Digest of Electronic Government Policy and Regulation*, 29, 175–179.

Heeks, R. (2003). "Most eGovernment-for-development projects fail: How can risks be reduced?" *Institute for Development Policy and Management, University of Manchester*, iGovernment Working Paper No. 14. Available at http://www.sed.manchester.ac.uk/idpm/research/publications/wp/igovernment/documents/igov_wp14.pdf, last accessed on 10/15/08.

Heeks, R., and Bailur, S. (2006). "Analysing eGovernment research: Perspectives, philosophies, theories, methods and practice," *Institute for Development Policy and Research, University of Manchester*, Working Paper No 16. Available at http://www.sed.manchester.ac.uk/idpm/publications/wp/igov/index.htm, last accessed on 09/16/08.

Huerta, E., and Sandoval-Almazan, R. (2007). "Digital literacy: Problems faced by telecenter users in Mexico," *Information Technology for Development*, (13: 3), 217–232.

INEI. (2000). *Política nacional de informática*. INEI—National Statistics and Information Technology Institute, Lima, Peru.

INEI. (2007). *Perú: Crecimiento y distribución de la población, 2007*. INEI—National Statistics and Information Technology Institute, Lima, Peru. Available at http://censos.inei.gob.pe/censos2007/documentos/ResultadoCPV2007.pdf, last accessed on 08/20/08.

INEI. (2008). *Las tecnologías de información y comunicación en los hogares*. INEI—National Statistics and Information Technology Institute, Lima, Peru.

International Monetary Fund. (2008). *Third review and inflation consultation under the stand-by arrangement and request for waiver of applicability of performance criteria*. IMF Country Report No. 08/258, International Monetary Fund, Publication Services, Washington, DC, USA. Available at http://www.imf.org/external/pubs/ft/scr/2008/cr08258.pdf, last accessed on 09/15/08.

Internet World Stats. (2008). *Internet world stats—Usage and population statistics*. Available at http://www.internetworldstats.com/sa/pe.htm, last accessed on 10/16/08.

Jain, V., and Kesar, S. (2008). "E-government implementation challenges at local level: A citizens' centric perspective," *Proceedings of the 14th Americas Conference on Information Systems*, Toronto, Canada, 1–10.

Janssen, M., and Cresswell, A. (2005). "Enterprise architecture integration in e-government," *Proceedings of the 38th Annual Hawaii International Conference on System Sciences*, Big Island, HI, USA, 1–10.

Kvasny, L., and Keil, M. (2006). "The challenges of redressing the digital divide: A tale of two US cities," *Information Systems Journal*, 16, 23–53.

Lam, J. C. Y., and Lee, M. K. O. (2006). "Digital inclusiveness—Longitudinal study of Internet adoption by older adults," *Journal of Management Information Systems*, (22: 4), 177–206.

Layne, K., and Lee, J. W. (2001). "Developing fully functional e-government: A four stage model," *Government Information Quarterly*, (18: 2), 122–136.

Macintosh, A. (2004). "Characterizing e-participation in policy-making," *Proceedings of the 37th Annual Hawaii International Conference on System Sciences*, Big Island, HI, USA, 1–10.

Madon, S. (2006). "IT-based government reform initiatives in the Indian state of Gujarat," *Journal of International Development*, 18, 877–888.

Mahrer, H., and Krimmer, R. (2005). "Towards the enhancement of e-democracy: Identifying the notion of the 'middleman paradox'," *Information Systems Journal*, 15, 27–42.

Medaglia, R. (2007a). "The challenged identity of a field: The state of the art of eParticipation research," *Information Polity*, 12, 169–181.

Medaglia, R. (2007b). "Measuring the diffusion of eParticipation: A survey on Italian local government," *Information Polity*, 12, 265–280.

Molina, A. (2003). "The digital divide: The need for a global e-inclusion movement," *Technology Analysis & Strategic Management*, (15: 1), 137–152.

Municipalidad de Miraflores. (2008a). *Simulacro de votación electrónica, niños también pudieron votar*. Lima, Peru. Available at http://www.miraflores.gob.pe/noticias.asp, last accessed on 10/16/08.

Municipalidad de Miraflores. (2008b). *Vecinos eligieron a sus representantes en elecciones de juntas de delegados*

vecinales 2008. Lima, Peru. Available at http://www.miraflores.gob.pe/noticias.asp, last accessed on 10/16/08.

Olphert, W., and Damodaran, L. (2007). "Citizen participation and engagement in the design of e-government services: The missing link in effective ICT design and delivery," *Journal of the Association for Information Systems*, (8: 9), 491–507.

ONGEI. (2006). *Estrategia nacional de gobierno electrónico*. ONGEI—National E-Government and Information Technology Office. Available at http://www.ongei.gob.pe/Bancos/banco_normas/archivos/Estrategia_Nacional_Gobierno_Electronico.pdf, last accessed on 10/15/08.

Purvis, R. L., Sambamurthy, V., and Zmud, R. W. (2001). "The assimilation of knowledge platforms in organizations: An empirical investigation," *Organization Science*, (12: 2), 117–135.

Rodriguez, M., and Santana, M. (2006). "Miraflores: Una ciudad digital," Paper presented at the *1st Iberoamerican Conference on e-Government*, Santiago, Chile.

Roy, J. (2003). "The relational dynamics of e-governance: A case study of the City of Ottawa," *Public Performance and Management Review*, (26: 4), 391–403.

Sipior, J. C., Ward, B. T., Volonino, L., and Marzec, J. Z. (2004). "A community initiative that diminished the digital divide," *Communications of the Association for Information Systems*, 13, 29–56.

Svensson, J., and Leenes, R. (2003). "E-voting in Europe: Divergent democratic practice," *Information Polity*, 8, 3–15.

WSIS. (2003). *Geneva Declaration of Principles*. World Summit on the Information Society. Available at http://www.itu.int/wsis/documents/doc_multi.asp?lang=en&id=1161|1160, last accessed on 10/15/08.

Yildiz, M. (2007). "E-government research: Reviewing the literature, limitations, and ways forward," *Government Information Quarterly*, 24, 646–665.

Yin, R. K. (2003). *Case study research: Design and methods* (3rd Ed.). Sage Publications, Thousand Oaks, CA, USA.

About the Author

Martin Santana is a Professor of Information Technology at the Graduate School of Business Administration of ESAN University in Peru, and is a Japan Foundation Fellow at the Graduate School of Asia-Pacific Studies of Waseda University in Japan (2008–2009). He is also the current President of the Latin American and Caribbean Association for Information Systems. His recent research deals with the processes of development and implementation of e-Government. This research includes evaluations of e-Government initiatives at national and local levels and of their effects on digital inclusion and social inequalities. It also includes the development of theoretical approaches to understanding the ways in which governments support governance reform through the use of information and communication technologies. Professor Santana's research has been published in several academic journals and top conferences such as Journal of Computer Personnel, Latin America and Caribbean Journal of the Association for Information Systems, IOS Press series on Global e-Governance, IGI Global series on Information Technology, Americas Conference on Information Systems, Decision Sciences Institute Annual Meeting, and International Conference of the Iberoamerican Academy ofManagement. He earned his Ph.D. in Business Administration in 1997 from Florida International University in the USA; and also holds a Master of Science in Management of Information Systems from HEC Montreal in Canada; a Post Graduate Diploma in Computer Science from the ENSIMAG in France; and a Bachelor of Science in Industrial Engineering from the Universidad de Lima in Peru. Professor Santana has performed a variety of service roles at the annual conferences of the Association for Information Systems, and in particular will serve as Conference Co-chair of the 2010 Americas Conference on Information Systems in Lima, Peru. He has participated in executive education programs in numerous multinational companies, and has also consulted with several government agencies in Peru, the USA and Canada, and with the World Bank and the Inter-American Development Bank. Professor Santana has served on several editorial boards for academic journals, including Journal of Electronic Commerce in Organizations and Latin American and Caribbean Journal of the Association for Information Systems.