



Adoption of e-government in three Latin American countries: Argentina, Brazil and Mexico

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Abstract

This paper discusses the adoption of e-government in three Latin American countries: Argentina, Brazil and Mexico. The study first presents a conceptual framework to examine the development and services of e-government, which is applied to assess its adoption in these leading Latin American economies. Study findings can shed some light on each nation as a model for successful development as well as the implementation of e-government in a non-industrialized, developing nation. The analysis also seeks to fill a void in the study of e-government in less developed nations, most of which are trying to catch up with their developed counterparts in this crucial aspect of digital governmental development.

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At the dawning of the 21st century, e-government applications stand poised to transform governmental communication, although their operational potential remains largely unfilled (e.g., Becker & Slaton, 2000; Berhel, 2000; Bouras et al., 1998). Scholars suggest that the online “intermedia” modality (Lin, 2002)—as a hybrid of multiple communication technologies—can facilitate government communication functions more rapidly, efficiently and cheaply than offline vehicles (e.g., Dutton, Elberse, & Hale, 1999). Yet the transition from policy formulation to implementation still eludes many developing nations, underscoring that e-government is a very complex socio-technical system, highly dependent upon overall institutional maturity, regulatory/policy frameworks, and socio-cultural considerations (e.g., Gauld, Goldfinch, & Dale, 2006; Heeks, 2002; United Nations, 2002; West, 2002).

Perhaps the most familiar, if controversial, of these is public access to the political process (see, e.g., Artenton, 1987; Automated Election Administration, 2002; Larsen, 1999; Modernizing Government, 1999; Poole, 1982; Reilly, 2002). Yet, while e-government applications are revolutionizing such areas as record keeping—particularly in the West—most nations still rely on offline channels to accommodate most of their daily governmental correspondence (e.g., Berhel, 2000; Bouras, Kastaniotis, & Triantafillou, 2000; Jeffres, 2007).

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e-Government thus remains an alternative rather than a primary outlet for governmental communication. Mirroring the “diffusion lag” characteristic of other online transactions, the adoption of e-government is a function of constraints in delivery channel efficiency (Jones & Vijayasarathy, 1998; Stärder, 1999) as well as issues related to trust, privacy and security (e.g., Gauld et al., 2006; Ratnasigham, 1998).

These issues lie at the crux of modernization efforts in the developing world, perhaps best crystallized by a WSIS Plan of Action (2003, E, 28f) directive outlining that,

All countries and regions should develop tools so as to provide statistical information on the Information Society, with basic indicators and analysis of its key dimensions. Priority should be given to setting up coherent and internationally comparable indicator systems, taking into account different levels of development.

This essay discusses the adoption of e-government in the three largest Latin American countries—Argentina, Brazil, and Mexico—where the issue represents a pressing concern (e.g., eLAC, 2007). The analysis begins by reviewing a conceptual framework to examine the development and services of e-government, which will be applied in these three venues. Study findings can help shed light on each nation as a model for successful development and implementation of e-government in developing Latin American nations. The article also seeks to fill a void in the study of e-government in less developed nations, now trying to catch up with their developed counterparts in this crucial aspect of digital governmental development.

1. Conceptual framework: what is e-government?

e-Government refers to the process of connecting citizens digitally to their government in order that they might access information and services offered by government agencies. Nations have traditionally relied on telephone networks to fulfill similar telecommunication functions (e.g., Atkin, Hallock, & Lau, 2007; Atkin, Lau, & Lin, 2006; Baldwin, McVoy, & Steinfield, 1996; Bates, Albright, & Washington, 2002; Singh, 1999), but information services are being increasingly migrated to Web-based modalities (e.g., Grant & Meadows, 2007; Lin & Atkin, 2007). At present, Argentina, Brazil, and Mexico rank among the most advanced nations globally in terms of web presence, based on an e-government benchmarking report from the United Nations (see eLAC, 2007).

There are four relationships in the e-government interactive processes: government-to-government, government-to-business, government-to-employees, and government-to-citizens (e.g., Balutis, 2001a, 2001b; “eGovernment indicators”, 2001). For the purposes of this paper, only government-to-citizen relationships will be discussed, insofar as they are designed to close the gap between citizens and government by way of reducing public indifference and distrust of the government (e.g., Balutis, 2001a; Gauld et al., 2006; West, 2002). e-Government also has been closely associated with the democratization of political processes due to the rise in citizen interaction and access to information (e.g., Bucy & Newhagen, 2004; Jeffres, 2007; UNPAN, 2004).

Governments across the globe wish to provide their citizens with a digitized government by allowing them to access information, communicate with government agencies, and participate in transactions digitally. Nations that have lagged behind in technological development are increasing their rate of adoption in the information technology sector, particularly by adding applications in both private and public settings (Balutis, 2001a, 2001b; Lee, Leung, & So, 2004; Lin & Atkin, 2002; Pelton, 2003; Steinfield, 2002). Such initiatives are based on the assumption that, over time, the provision of accessible services and information online will save time and effort for governments and citizens alike (e.g., Bucy & Newhagen, 2004; eLAC, 2007).

Scholars and practitioners have attempted to fashion definitions for e-government since Smith (1972) first wrote of a “wired nation” over three decades ago. This paper seeks to combine three different theoretical discourses on the progression of e-government, proposed by Balutis, Howard and the World Bank, respectively, to build a comprehensive conceptual framework. The proposed model will be used, in particular, to inform an analysis of services as well as overall national development prospects.

Balutis (2001a) is representative of work that classifies the development of e-government into four phases. They include, in sequential order, *information dissemination*, *forms-only*, *end-to-end electronic transactions*, and *transforming government*. Information dissemination is the least-developed and basic phase, describing a stage in which information is provided online. In the forms-only phase, users can download forms electronically.

End-to-end electronic transactions involve having the users begin their transaction digitally (such as filing taxes) and ultimately ending their transaction in the same way (e.g., having tax return money deposited electronically into their bank account); the transaction is hence characterized as being entirely executed digitally.

The last phase is the idealized goal of e-government, in which the government provides all services and information online. In this way, e-government acts as a stand-in for traditional forms of government services—which will no longer be necessary—as users can simply log onto the Internet to meet their needs. An afternoon-long trip to the DMV might, for instance, be replaced by a 10 min Internet session to pay for automobile registration renewals, title requests and the like. Balutis also describes this phase as a “seamless e-government,” where users will not have to understand the structures of government to be able to navigate through digital government websites.

In functional terms, the typical frustrations encountered concerning the confusion and inefficiency often associated with state websites (e.g., eEurope Initiative, 2002; Lee et al., 2004) will be eliminated—such that users would not have to “jump from site to site”—since the relevant government agencies will be interconnected and linked (Balutis, 2001a). This is consistent with calls to explicate an “agenda of priorities for the implementation of standards for the interoperability of electronic government services” (see eLAC, 2007, Plan of Action Presentation, Actividad 15.2). At the time of his 2001 study, Balutis (2001a, 2001b) noted that only a small number of countries were offering initiatives in the fourth phase, as even the US government is still far from producing a seamless government.

In a similar vein, Howard (2001) divides e-government progress into three phases. The first is to *publish*, in which e-government has only a basic electronic presence with limited published information. The second phase is to *interact*, where citizens can correspond with government via e-mail and chat rooms. The last phase is to *transact*, where the governments provide services to citizens to participate in transactions via digital government. This last phase, according to Howard, involves the “maximized service potential” of e-government (Howard, 2001, p. 7).

On a wider scale, the World Bank (2001) has conducted a study of the e-governments in various countries worldwide. The World Bank attempts to identify two major factors in e-government, namely, *communication* and *linkage type*. Communication is divided into four categories, *information publishing and dissemination*, *uni-directional (“contact us”) capabilities*, *bi-directional (“inquiry”) capabilities*, and *transaction capability*. In the first category, users can access information and publications online. The second category encompasses communication capabilities on a multilateral level, with users contacting government workers and receiving responses digitally. The third category is characterized as users asking for certain publications such as public registry records, birth certificates, etc. and specific services, such as evaluation of property values, digitally.

The last phase consists of transactions such as paying taxes, purchasing land, etc. In this typology, the linkage types consist of two categories: *vertical linkage* between government levels (such as local, state and federal), and *horizontal linkage* between inter-level government agencies. The World Bank views vertical and horizontal linkage as crucial to the success and development of e-government (World Bank, 2001).

The Balutis, Howard and World Bank concepts of e-government are combined here to formulate a conceptual framework to assess its adoption in the three criterion Latin American countries. Table 1 details the conceptual framework by integrating the three theories discussed, respectively. The conceptual framework proposed in this paper will classify the adoption of e-government development into four phases: *information dissemination*, *interaction*, *transaction* and *seamless service*.

Briefly, information dissemination is the basic phase of digital government, in which governments make information available to users. This is followed by the interaction phase, which encompasses the ability to contact governments in “interactive correspondence” capabilities—such as e-mail, chat rooms and further digital contact—as well as “request” capabilities. The latter includes users searching for specific documents, filling out forms, or asking for services (e.g., the request of a birth certificate, quote for property value, etc.) and receiving such requests digitally (World Bank Report, 2001). This similar, but re-defined component of the typology was selected because these phases summarize various e-government applications more thoroughly and parsimoniously.

The third phase consists of an ability to undertake all transactions online, including accessing personal information, filing taxes, purchasing property digitally, as well as other end-to-end digital transactions.

Table 1
Proposed conceptual framework for the study of e-government

Phases of the development of e-government	World bank criterion	Balutis' four phases of development	Howard's phases of development
Information dissemination stage	Information publishing/dissemination	Information dissemination stage	Publish
Interaction stage: “correspondence” service capabilities and “request” service capabilities	Uni-directional capabilities; bi-directional capabilities	Forms only stage	Interact
Transaction stage	Transaction capability	End-to-end transaction	Transact
Seamless service stage: inter-level linkage and intra-level linkage	Vertical linkage; horizontal linkage	Transforming government	Not applicable

Finally, the fourth phase encompasses a seamless service comprised of horizontal or vertical linkages—also known as *inter-level linkage*—between and among the different levels of government and *intra-level linkage*, within each level, respectively. If both inter-level and intra-level linkages are applied, then e-government will be conducted as an interconnected, interoperable web, with users not needing to know the structures of government in order to access information, interact or transact digitally. This can render one's patronage more user-friendly, straight forward, helpful and increase the popularity of digitalized government (e.g., Baltius, 2001a, 2001b; Howard, 2001).

Each phase of e-government adoption can be applied in governmental domains encompassing the federal, provincial/state and local levels. Federal-level government functions are, of course, supported by the national government. Websites at the state level are available only in certain states, typically in those with higher populations. The local level is also a subject of only a few local websites; those of the major cities are accessible to citizens. However, less populated cities may not have government websites available (e.g., Lee et al., 2004).

Modifications underpinning the development of the conceptual framework are also incorporated into the present analysis. In particular, the World Bank divides the interaction stage into two domains: bi-directional (“Inquiry”) and uni-directional (“Contact Us”) capabilities. These two domains were, respectively, adapted into two similar, but redefined sub-areas: *Correspondence interaction services* and *“Request” interaction services*. Simply put, correspondence interaction includes direct contact with government employees through e-mail, chat rooms, etc., while “request” interactions encompass the service provided when a user asks for certain documents, forms or specific services, such as the evaluation of one's property value or tax by an owner.

2. Research approach

Latin America represents an appropriate study target owing to the dearth of e-government work in this area. Of the 17 countries comprising the region, the paper focuses on the three largest—Brazil, Mexico, and Argentina—because they also rank among the leaders in criteria in areas related to population size: the number of Internet service providers and Internet users (e.g., CEPAL, 2006). This is based on the assumption that e-government adoption can best be studied in nations that enjoy high levels of Internet service provider (ISP) penetration which, in turn, is critical to the promotion of citizen applications. Rogers (2002) argues, for instance, that if a citizenry lacks access to the Internet, then e-government will not be fully accomplished or successful. Research suggests that successful adoption of e-government in industrialized and technologically advanced nations is due, in large measure, to their ability to serve a large user base and realize economies of scale (e.g., CEPAL, 2006; Howard, 2001).

Within Latin America, the technological background and overall necessity for e-government is variable in comparison to other developed and high-tech nations, with the former historically found lacking. ISPs and

Table 2

Internet service providers and internet and media usage in Latin America

Country	Area (sq. mi.)	Population est. 2002	Phone usage ^a	Cell phone usage	Radio usage ^a 1997	TV usage ^a 1997	Internet usage 2000	ISPs ^b 2000
Mexico	761,602	101,879,171	1998–9.6M	1998–2.02M	31,000,000	25,600,000	3,900,000	1999– 167
Brazil	3,286,470	176,029,560	1997–17.04M	1997–4.4M	71,000,000	16,500,000	8,650,000	50
Argentina	1,068,296	37,812,817	1998–7.5M	1999–3M	24,300,000	7,950,000	900,000	33
Colombia	439,733	41,008,227	1997–5.434M	1998–1.8M	21,000,000	4,590,000	600,000	18
Ecuador	109,483	13,447,494	1997–899K	1997–160K	4,150,000	1,550,000	20,000	13
Peru	496,223	27,483,864	1998–1.51M	1998–505K	6,650,000	3,060,000		1999– 15
Venezuela	352,143	23,916,810	1998–2.6M	1998–2M	10,750,000	4,100,000		1999– 11
Bolivia	424,162	8,445,134	1996–328K	1997–116K	5,250,000	900,000	35,000	9
Honduras	43,278	6,560,608	1997–234K	1997–14K	2,450,000	570,000	20,000	8
Chile	292,235	15,489,930	1998–2.6M	1998–944K	5,180,000	3,150,000	625,000	7
Guatemala	42,042	13,314,079	2000–665K	2000–663K	835,000	1,323,000	65,000	5
Nicaragua	49,998	4,918,393	1996–140K	1995–4.4K	1,240,000	32,000		1999– 5
Uruguay	68,039	3,360,105	1995–622K	1995–40K	1,970,000	782,000		1999– 5
El Salvador	8,124	6,353,681	1998–380K	1997–40K	2,750,000	600,000	40,000	4
Paraguay	157,046	5,734,139	1995–167K	1995–16K	925,000	515,000		1999– 4
Costa Rica	19,730	3,834,934	1998–450K	2000–143K	980,000	525,000	150,000	3
Guyana	83,000	698,206	2000–70K	2000–6K	420,000	46,000	3,000	3
Panama	30,193	2,845,647	1998–325K	1995–0	815,000	510,000		3
Belize	8,867	262,999	1997–31K	1997–3K	133,000	41,000	12,000	2
Suriname	63,039	433,998	1996–57K	1995–3.6K	300,000	63,000		1999–1
US	3,537,441	281,421,906	1997–178M	1997–55.31M	1997–575M	1997–219M	2000–11.5M ^c	1999–7,600
US	3,537,441	281,421,906	1999–178M	1997–55.31M	575,000,000	219,000,000	2000–11,500,000	1999–7,600

^aAny estimations are to the nearest thousand.^bUS internet usage according to 2002 Almanac as 41% of total population.^cGDP per capita for the year 2000 unless otherwise indicated.

Internet user resources are available for most of the Latin American countries analyzed. If the information is not available, a secondary criterion is used, that of technological and media usage (i.e., phone, cell phone, radio, and television usage). Table 2 outlines statistics for all Latin American countries, with United States statistics included for comparison purposes only (World Almanac, 2002).

Based on these two criteria, Argentina, Brazil, and Mexico boast the highest number of ISPs and Internet users and were thus singled out for analysis. Argentina has a total of 33 ISPs and an estimated 900,000 Internet users. Brazil has a total of 50 ISPs and an estimated 8.65 million users—the largest number in Latin America. It is important to bear in mind that Brazil is by far the largest country in Latin America in terms of population as well as area, and therefore the number of users far exceeds that of other Latin American countries. Mexico has the largest number of ISPs, 167, and its Internet user base includes several million people (Dallas, 2001; eLAC, 2007). The Internet user bases for Argentina, Brazil, and Mexico were thus deemed to have reached “critical mass” levels (Rogers, 2002) sufficient for our analysis.

The World Bank Report has provided a basic analysis of four countries (Argentina, Brazil, Colombia, and Mexico) in the adoption of e-government in Latin America, within the parameters of its own conceptual framework. The present analysis uses the World Bank Report data and re-applies them according to the modified conceptual framework, as explained in the earlier section of the paper. World Bank Reports present only a tabular analysis of e-government in Argentina, Brazil, and Mexico and no summary of the findings, with only a brief statement of the progress of e-government in terms of policies, government committees and, in one case, current issues in development. This framework thus seeks to add depth to their report through an applied conceptual model and summary of analyses.

Within the World Bank Report, a selected total of government websites in each country was utilized to study the progress of e-government. Specifically, as shown in Appendix A, 14 federal, state and local government websites were used to study Argentina, along with 15 federal, state and local government websites for Brazil and 15 federal, state and local government websites for Mexico. Although the criterion for selection

Table 3

Analysis of e-government in Argentina, Brazil and Mexico based on the proposed conceptual framework:

Phases of e-government	Argentina	Brazil	Mexico
Information dissemination phase reached...	Federal YES State YES Local YES	Federal YES State YES Local YES	Federal YES State- YES Local YES
Interaction phase reached	Federal YES	Federal YES, but “request” services are not available	Federal YES
	State YES, but “request” services are not available	State YES	State YES
	Local YES	Local YES	Local YES
Transaction phase reached...	Federal YES State NO Local NO	Federal NO State YES Local NO	Federal YES State NO Local NO
Seamless service reached...	Federal. YES	Federal YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable State YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable Local YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable	Federal YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable State YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable Local YES but only with vertical, inter-level linkage. Horizontal, intra-level linkage is not applicable

of the websites was not included in the World Bank report,¹ it appears that the selection process was not determined to be random or scientific. However, these sites are official sites and are, respectively, representative of the e-government applications in each of the three nations.

3. Findings—an assessment of e-government in Argentina, Brazil and Mexico

Table 3 details the nature of the e-government systems in place in Argentina, Brazil, and Mexico, per the World Bank Report on Latin America. The findings in each country are presented in turn.

3.1. Argentina

Argentina has what could be characterized as the most advanced usage and application of e-government in the three criterion countries. With phases one and two, both the local, state and federal governments have

¹The websites listed in the World Bank report comprise the total number examined. Information on the criteria used by the World Bank for website selection is not publicly available. This study will still represent case studies of major, if not complete, e-government websites available in the three countries examined in this study.

achieved the requirements of classification in these stages of development. Information is distributed digitally by e-government on all three levels. The interactions of e-government in Argentina on the local and federal levels can be found in both correspondence and request services. Within the state level, however, only correspondence capabilities are provided. A logical next step would involve having state government officials devise a plan of implementation for requesting services, given its importance in fulfilling the overall call for service to the population.

In evaluating Argentina's front-office services, it is important to note that the country has also taken an active role in offering Freedom of Information (FOI) legislation (see www.privacyinternational.org, 2006). That said, the Argentine Constitution does not include a general right of access to either public documents or information, although Section 86 Article 43(3) recognizes a right of individuals to access and correct their own records held by private or public bodies. In addition, Article 41(2) compels authorities to provide information to citizens on environmental matters (see [National plan for the Modernization of the State, 2006](#)).

As for operational capabilities, citizens can only transact digitally at the federal level and are not able to do so at the local and state levels. Argentina is the most advanced of the three countries, in that officials enjoy inter-level linkage on both levels of government and intra-level linkage only on the federal level, which is a step in the direction towards seamless and straightforward service. Although particular areas can benefit from improvement, the digital government in Argentina is on its way to full implementation and adoption, with the federal service meeting the needs of its users, according to the criterion underpinning the framework.

In fact, it is fair to say that Argentina's digital government system has, for the most part, successfully implemented e-government technology. The government has installed "digital signatures" or online authentication, which the World Bank regards as an effort to "achieve the proposed goal of integrating all levels of government and services" (World Bank Report, 2001). Recently, Argentina created a government agency, the Modernization Secretary, under the auspices of the Sub-Secretary for Public Administration. This agency "accepts responsibility" for the implementation, advancement, development, and promotion of e-government to ensure that the development of digital government continues to improve at a steady rate and in accordance with the increasing needs of its citizens (World Bank Report, 2001). The aforementioned lack of services in Argentina, per the conceptual framework, can be addressed by this government agency. These various indicators suggest that Argentina's e-government readiness—which ranks only behind Chile in Latin America—has been efficient and effective (UNPAN, 2004).

3.2. Brazil

Brazilian users can access information made available to them digitally by e-government on all three levels considered here. The interactions of e-government in Brazil on state and local levels are available. Recent government volumes published in Portuguese expand on main e-government dynamics outlined in the World Bank survey (see [Chahin, 2004](#); [Ferrer Santos & Queriroga, 2004](#)), updating a seminal study of the Brazilian information sector titled *Livro Verde* (see [Takahashi, 2002](#)). These accounts variously detail strides that the government has taken to build on developing industrial structures and export platforms for several countries around the globe.

Such work also outlines the limitations in Brazil's e-government infrastructure, including the extent to which it can satisfy citizen needs, increase bureaucratic efficiency, and overcome distrust between the government and its citizenry. For instance, the federal level does not enjoy request-service capabilities, which constrains the overall development of e-government. In order for digital government to provide the full service needs of its citizens, the federal level must have request-services available. Overall, then, Brazil is behind Argentina in several respects. It is lacking greatly in transaction capability, with citizens being able to transact only at the state level.

Transaction capability remains vital and phase three must be achieved before the full success of e-government can be realized. With respect to seamless service, inter-level linkage is developed on all levels, but the intra-level linkage within the various levels of government has yet to be developed at any level. Brazil is moving deliberately along the road to implementing full e-government capabilities, with the creation of a state regulatory bill that addresses the technology of the web. This regulatory bill (no. 7549) was created in the state of Bahia, Brazil and approved in April 1999, serving as reference for the creation of web pages for all—directly

and indirectly managed entities and agencies serving under the executive branch in the state of Bahia (see [Standardization of Web Pages, State of Bahia, 1999](#); World Bank Report, 2001).

The intentions of this legislation, generally speaking, are to provide necessary information about the primary services offered within the state by its government as well as to make some traditional method services available online. Even though these goals are modest—encouraging the provision of just a few services through online and wireless modalities—the objectives are in line with e-government goals. Brazil's progress is thus positive and facilitates the overall evolution of federal digital government. The state of Bahia's initiative to enact such legislation will hopefully generate a domino effect, with other states (and eventually the federal government) moving to implement other regulatory bills. Overall, the adoption of digital government in Brazil has been smooth, but a fair amount of application is still needed in order to provide full e-government services and capabilities.

3.3. Mexico

The Mexican e-government infrastructure is also providing information online to users at all levels of government and by facilitating interactions at all levels as well. Transaction capacity is available, however, only at the federal level. No such services are available at the local or state levels. This lack of service is problematic, given that the overall system is only as strong as its weakest links. The ability for e-government to revolutionize the traditional services provided to citizens—particularly through the creation of a digitally comprehensive and straightforward, accessible service that can be readily adapted—is contingent upon users being able to complete transactions online at all levels. Although it is a great step to have this service available to federal online users, e-commerce services will generate little impact until they reach end-users. Such access will only be as complete as the transaction capabilities of state and local digital government websites. Like, Brazil, inter-linkage has also been established on all levels. But, intra-level linkage is not yet available within any level, creating a hole in the desire for the kind of inter-connected, seamless service that allows users to easily navigate from separate federal agencies in an interlinked and user-friendly manner.

In addition, the Mexican Constitution was amended in 1977 to include a right of FOI. In particular Article 6(518) stipulates, in part, that “the right of information shall be guaranteed by the state.” The Mexican Supreme Court made several decisions further strengthening that right (see [ELAC, 2006](#)). Importantly, the Federal Law of Transparency and Access to Public Government Information was unanimously approved by the Parliament in 2002 and signed into law, taking effect in June 2003.

Even though [Table 3](#) shows that Mexico is quite advanced and on its way to realizing successful integration—ranking 12th in the world—several barriers remain on the road ahead ([West, 2002](#)). To begin, very little governmental priority is being given to e-government due to the low number of computer users in the country; therefore, further development is unlikely in the near future (World Bank Report, 2001). Another issue is that most sites are predominantly informational and not attuned to the needs of citizens and, overall, the capacity of e-government is lacking. Some services are available to users, such as access to public registry records but, for the most part, the most developed sector of is that of government-to-business service, not government-to-citizen service (World Bank Report, 2001).

4. Policy analysis

Comparing the relative progress in e-government adoption across the present cases, it seems that the transition to a digital government can be facilitated by a developed governmental agency or department that can appreciate the time, effort and money involved with developing e-government. In the United States, the Chief Information Officer (CIO) and an advisory council work “to maximize government effectiveness in using information technology” (American Libraries, 2001, p. 16). With the help of the CIO and this council, the US has coordinated and attempted to execute a system of “effective access” to government information and coordinated information policies.

In many countries, e-government advocates continue to face resistance when pressing their concerns over such issues as funding and expansion of current services (e.g., Arenton, 1987; [Dutton et al., 1999](#); So et al., 2004). Other issues (e.g., industrial development) are seen as more compelling, often relegating longer

term initiatives—like the advancement and improvement of digital government—to later consideration (e.g., United Nations, 2004). In most Third World nations, initiatives to address issues of e-government have proven unsuccessful, with many countries finding that funding and overall efforts to initiate or improve digital government is not an important concern. However, there are measures that governments can take to encourage the adoption of e-government. Adapting existing systems from the private sector and coordinating with other existing agencies, for instance, represents a more time-efficient and cost-effective method for implementing these services (e.g., Heeks, 2002; Steinfield, 2002).

Prioritizing the development of e-government should be an issue of concern for many governments. The enhancement of e-government applications can be extremely beneficial, as exemplified by positive press coverage in such countries as Australia and Canada. The position these two governments take can purportedly "...exploit the full power of document management and records processing to build an open-ended e-relationship that invigorates the daily business by which democracy is sustained" (Government Computer News, 2001, p. 2). Governments should at the least create a plan of action with a projected year of implementation. Countries, such as the United Kingdom, budgeted to ensure that all services were online by 2005. Other, less-industrialized nations—such as Romania, South Africa and the United Arab Emirates—have also realized the vital importance and long term advantages of e-government and have all created a plan of action, earmarked a budget for implementation, and established a projected year of completion, typically within a five to six year span ("UAE to install e-government systems," 2001; "E-government still a distant goal," 2001; Rogers, 2004).

Of course, the objectives of efficiency, serving the needs of the citizenry (e.g., particularly time savings), and reducing opportunities for corruption (e.g., e-procurement) represent some of the chief benefits of e-government. Contrary to dystopian predictions accompanying telematic media—reminiscent of Big Brother (Orwell, 1948)—e-government measures can help to reduce the gap in distrust between governments and their citizens. Success in this area is by no means assured, however, as other gaps presented by computer failures (e.g., Gauld et al., 2006) could well alienate citizen-patrons.

Interoperability among the four phases will thus be crucial, particularly given that Latin American governments are beginning to advance from phase 2 to phase 3 in some applications (Regional Information Society Action Plan eLAC, 2007). In particular, this seamless service provision necessitates full interoperability of all databases in the e-government back-office. According to these estimates, back-office work represents roughly 90% of e-government initiatives in the four phase benchmark outlined earlier, as front-office websites are the only visible tip of the e-government colossus. Once glitches in back-office interoperability are overcome, however, patrons will face a raft of privacy concerns (e.g., Lee, 2007).

The present analysis of these issues could be further informed by a wider consideration of the literature on new media adoption and social change, particularly as it relates to such parallel innovations as telework, e-commerce, digital divides and implications for privacy, economic development and the like (e.g., Bouras et al., 2000; Lau, Kim, & Atkin, 2005). Focusing on access to government information, for instance, scholars employ such perspectives as diffusion theory (e.g., Rogers, 2002) to distinguish between proactive dissemination of policies—encompassing widespread communication from governments to their constituents—and more reactive approaches. Returning to the US model, this distinction is evident in the 1996 Electronic Freedom of Information Act, which required proactive electronic publication of all agency decisions and related materials within a year of their implementation, alongside reactive provision of information requested through the Freedom of Information Act (e.g., Lee, 2007). That 1996 legislation was motivated, in part, by concerns about reactive provision of information and has helped catalyze e-government activities in the US.

As Table 4 details, Latin American nations currently rank near the bottom, in terms of Internet diffusion, but among the world leaders in Internet diffusion rates. This raises the issue of global and internal digital divides, given that e-government cannot be fully successful with incomplete connectivity. It will be difficult to achieve the goals of e-government—which include the creation of a new efficient and transparent form of government—if the technology is available only to the wealthiest 20% of the population. Such uneven diffusion might well leave the other 80% of society with inefficient service, difficult access locations, restricted operating hours and non-transparent processes. Thus, as Rogers (2002) and others argue, universal access to Internet services represents a necessary precondition—via public access centers and other such policies—for the provision of e-government services. Drawing from parallel experience in developing nations, it might be

Table 4
World Internet usage and population statistics

World regions	Population (2007 Est.)	Population % of world	Internet usage, latest data	% Population (penetration)	Usage % of world	Usage growth 2000–2007 (%)
Africa	933,448,292	14.2	33,334,800	3.6	3.0	638.4
Asia	3,712,527,624	56.5	398,709,065	10.7	35.8	248.8
Europe	809,624,686	12.3	314,792,225	38.9	28.3	199.5
Middle East	193,452,727	2.9	19,424,700	10.0	1.7	491.4
North America	334,538,018	5.1	233,188,086	69.7	20.9	115.7
Latin America/ Caribbean	556,606,627	8.5	96,386,009	17.3	8.7	433.4
Oceania/Australia	34,468,443	0.5	18,439,541	53.5	1.7	142.0
World total	6,574,666,417	100.0	1,114,274,426	16.9	100.0	208.7

Notes: (1) Internet usage and world population statistics were updated on Mar. 10, 2007. (2) Check on each world region for detailed regional information. (3) Demographic (Population) numbers are based on data contained in the world-gazetteer website. (4) Internet usage information comes from data published by Nielsen//NetRatings, by the International Telecommunications Union, by local NICs, and other reliable sources. (5) For definitions, disclaimer, and navigation help, see the Site Surfing Guide. (6) Data compiled for this table are derived from www.internetworkstats.com ([Miniwatts Marketing Group, 2007](#)).

expected that such innovations will initially widen domestic income and education gaps, only to help bridge them as the technology reaches the “flat” part of its diffusion curve (e.g., [Lin & Atkin, 2007](#)).

Later work should focus on comparing less developed and developed nations and the differences in the overall adoption and development of e-government—in terms of the current infrastructure in the nation—and how this effects integration. Studies might also, importantly, focus on how the development of e-government has helped nations facilitate their overall industrialization progress. For instance, [Howard \(2001\)](#) analogized the change of digital government—and the electronic environment that defines its evolution—to the transition from an agrarian economy to an industrial one in the United States. Further applications of this dialectic to the adoption of e-government in Third World nations, including the extent to which it facilitates a significant transition into an industrial and electronic economy, would enhance understanding of e-government adoption.

In a similar vein, later work might fruitfully extend the explication of policy implications and their effects on the growth of e-government, including dysfunctions associated with such downsides as computer failures ([Gauld et al., 2006](#)). In countries like Singapore, the United Kingdom, the United States, Canada, Australia and Argentina, governments have established agencies and policies that address e-government in terms of time-structured and budget plans, suggestions for improvement, and the like. Also applicable to a study of national policy implications would be a study exploring the policies and studies conducted and applied by international e-government committees—such as the World Bank and other non-profit organizations—which seek to advance e-government service in the global community. Further pooling of e-government resources, particularly among poorer countries, can help facilitate the development of these cyber-infrastructures.

In sum, the present study has provided an analysis of the four relationships of e-government (e.g., government-to-government). The findings are limited in that they rely on aggregate data collected from three countries, much of which was filtered by government officials before being reported to the World Bank. Such data may well be framed “for Western eyes,” possibly overstating progress made in these areas, in an effort to put the best face on general economic development. For that reason, a comparison between these less developed nations and the advanced nations—in terms of the different services and applications available—may prove instructive in later work. Further work might also profit from a wider consideration of such human factors (e.g., [Rogers, 2002](#)) as trust and Internet adoption, along with national traits including culture, history, and economic development. For instance, [West \(2002\)](#) suggests that governments should eliminate inconsistencies in Web design features and allow citizens to provide feedback (e.g., post comments) about a government agency.²

²The only other Latin American country ranked in the top 30 in West’s (2002) global e-government study was Chile (5th), while Argentina and Brazil were both tied for 86th place.

Further comparative findings and analyses may help nations with digitalized governments realize where to direct their focus on improvement. A wider understanding of differences in the relationships among the variables considered here, and how they apply to the present conceptual framework, should help facilitate the overall integration of e-government. Such work can help inform later research on the adoption of e-government in other under-developed nations, particularly through the conceptual framework of the four phases of digital government investigated here.

Appendix A. Nation-specific web sites consulted in this study

ARGENTINA

http://www.gobiernoelectronico.ar/sitio/poderes/poder_ejecutivo/poder_ejecutivo.htm
<http://www.sfp.gov.ar/DNO/index.htm>
<http://www.oirte.gov.ar/sitios/consultas/index.html>
http://www.setcip.gov.ar/Catalogo/catalogo_formulario.htm
<http://www.presidencia.gov.ar>
<http://www.presidencia.gov.ar/enlaces/otraspre99.html>
<http://www.gba.gov.ar/index7.htm>
<http://www.buenosaires.gov.ar/contactenos.asp>
<http://www.gba.gov.ar/index1.htm>
http://www.buenosaires.gov.ar/images/tit_buscar.gif
http://www.buenosaires.gov.ar/carta_jefe.asp
http://www.buenosaires.gov.ar/gobierno_funcionarios.asp
<http://www.buenosaires.gov.ar/institucional.asp>

BRAZIL

<http://www.comprasnet.gov.br>
http://www.brazil.gov.br/form_main.htm
http://www.brazil.gov.br/html/govest_set.htm
<http://www.governo.rj.gov.br/default.asp>
<http://www.governo.rj.gov.br/fale/default.asp>
<http://www.governo.rj.gov.br/servicos.asp>
<http://www.governo.rj.gov.br/target.asp?page=http://sabia.proderj.rj.gov.br/ixpress/upo/protocolo/upofram.dml>
<http://www.proderj.rj.gov.br/Rat.asp>
<http://www.governo.rj.gov.br/repasse.htm>
<http://www.rio.rj.gov.br/>
<http://www.rio.rj.gov.br/>
<http://www.rio.rj.gov.br/>
<http://www.salvadoratende.com.br/>
<http://www.pms.ba.gov.br/indexE1024.html>

MEXICO

http://www.presidencia.gob.mx/pages/f_busqueda.html
<http://www.senado.gob.mx/buzon.html>
<http://www.senado.gob.mx/buzon.html>
<http://www.compranet.gob.mx>
http://www.presidencia.gob.mx/pages/f_gob_internet.html
<http://www.sefiplan.gob.mx/menuframes/frameprin/buscarprincipal.htm>
<http://www.veracruz.gob.mx/>
<http://www.veracruz-llave.gob.mx/mail/>
<http://www.sefiplan.gob.mx/menuframes/frameprin/quejanet.htm>
<http://regiones.veracruz.gob.mx/>
<http://www.df.gob.mx/busca/index.html>
<http://www.df.gob.mx/espaciolibre/index.html>

<http://www.df.gob.mx/politica/preguntale/forma.html>
<http://www.df.gob.mx/servicios/estados.html>
 e-government web pages <http://www.compranet.gob.mx>

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