

# Inter-temporal Analysis of e-Government Enactment: The cases of Mexico and Colombia

Gabriel Puron-Cid

Centro de Investigación y Docencias  
Económicas, A.C. (CIDE), Mexico

gabriel.puron@cide.edu

Diana Carolina Valencia Tello

Universidad del Rosario  
Colombia

dianacvt@hotmail.com

Sofía Garcia-Diaz

Universidad Panamericana  
Mexico

anasofiagarcia@hotmail.es

## ABSTRACT

The literature has widely documented e-government benefits such as: efficiency, productivity, information access, and more participatory and democratic tools for citizens. However, various authors have also recognized failures and uneven adoption of e-government due to the complexity of the institutional arrangements, organizational forms and information technology in which e-government initiatives are implemented. Understanding the complex relationships between three components is critical for a successful implementation of e-government initiatives. The purpose of this study is to analyze the complex interaction of these three components by extending the enactment theory into an inter-temporal institutional model. This model is applied in two similar cases of e-government in Latin America and the Caribbean (Colombia and Mexico), with similar beginnings and goals but with unexpected different outcomes. The results of this analysis show that the enactment theory in an inter-temporal framework is a useful tool for advising toward a better implementation of e-government projects over time.

## Categories and Subject Descriptors

H.4.2 [Information Systems Applications]: Type of systems – e-government applications.

## General Terms

Management, Performance, Design, Theory

## Keywords

E-Government; Comparative Analysis; Enactment Theory

## 1. INTRODUCTION

E-government has emerged as an important tool to promote state modernization and to strengthen democracy [1,2,3]. However, there are huge differences when analyzing its levels of implementation and adoption across countries. In Latin America and the Caribbean (LAC), the problems of adopting e-government not only have to do with technology and its relation with a possible improvement of government performance, but also with

the way institutions and government organizations have been built and work in a particular point of time [9, 15,16, 20]. The purpose of this paper is to examine the role of the institutional arrangements and organizational forms during the adoption of e-government initiatives using two cases in the region: Colombia and Mexico. These two countries share similar contexts and strategies to promote e-government initiatives from the central government, and still present different results. The question to be answered using this comparative analysis of the institutional and organizational components of these two cases is what caused this uneven adoption. According to the 2012 UN report on e-Government for the LAC region, Colombia was the second country after Chile that achieved major advances in this field. This result obeyed to the development of effective public policies, guidelines and mandatory applications across agencies for implementing e-government projects. The same report ranked Mexico in the 6th position, after countries such as Uruguay and Barbados. This result corresponded to a particular arrangement of policies and the continuity given to these policies as well as the type of coordination model managed between institutions and the level of involvement of the executive.

The results of the comparative analysis carried in these two cases demonstrate the impact of the institutional and organizational settings on e-government adoption. In particular, these cases showed that their own institutional and organizational structures present challenges in terms of their traditional hierarchical and centralized structures, tools for monitoring progress of this type of projects, cross-agency coordination, executive involvement, participation and transparency, infrastructure deficiencies, and of course the wide digital divide in both countries. Another finding is that these components change over time. Therefore, existing theoretical frameworks should consider the inter-temporal aspect of e-government adoption.

We claim that these findings will help to improve the construction of e-government projects by identifying strategies that consider in an integral way the technological, institutional and organizational aspects of e-government adoption and how to monitor them over time. In this context, e-government adoption requires more than technological innovation. The implementation of e-government should consider the profound institutional arrangements, organizational changes, existing administrative structures, culture, traditions and administrative practices of public officials and politicians. This paper seeks to outline the main difficulties faced by LAC governments when implementing e-government and the possible solutions to counteract institutional weaknesses and old administrative practices.

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

ICEGOV2013, October 22-25, 2013, Seoul, Korea  
Copyright 2013 ACM 978-1-4503-2456-4/00/0010 ...\$15.00.

## 2. ENACTMENT THEORY FRAMEWORK

This framework attempts to explain the difference between plans and reality and has been useful to study e-government adoption in a context in which institutional and organizational settings [8, 10, 18]. The ET explains how the embeddedness of e-government projects based on their institutional and organizational structures influences the design, perception and use of ICTs and how these settings influence the final outcomes of the enactment technology process. Institutional and organizational forms influence not only the performance of the institutions that constitute public administrations, but also the technologies enacted (see Figure 1). Governments make plans to adopt certain technologies to produced expected outcomes. However, the results usually differ with the intended goals from the original plan. In order to successfully implement e-government initiatives, public administrators, policymakers and other stakeholders involved, need to pay attention to each of the element prescribed by the ET framework. It is also important to notice that these elements change over time. In order to maximize the practical value of the ET framework an inter-temporal component needs to be integrated for the purpose of continuous supervision, evaluation, and improvement of e-government offerings over time (see Figure 2). Every e-government initiative has stages in which each of the ET components are revised or adjusted. The “T” represents then the stages of development in which the e-government initiative is analyzed using the ET framework.

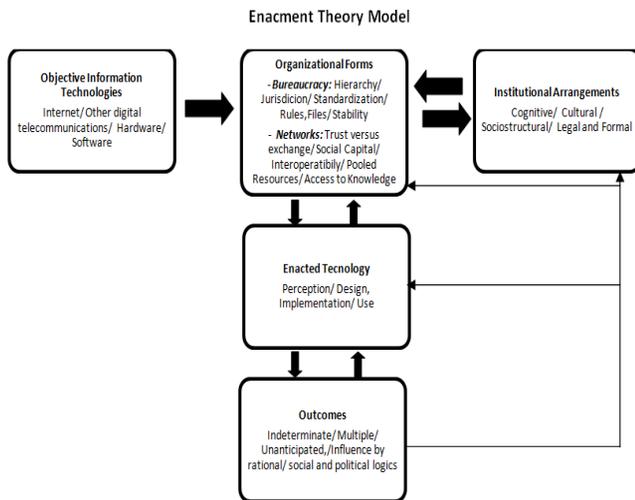


Figure 1. ET Framework adopted from Fountain [13]

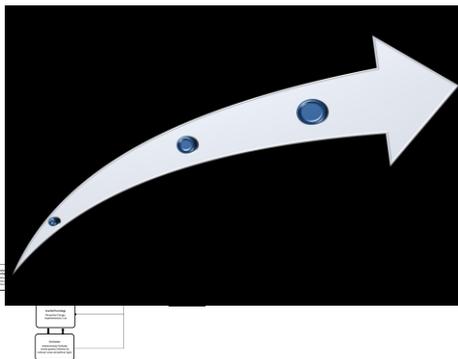


Figure 2. Inter-temporal Application of ET Framework

## 3. COMPARATIVE CASE ANALYSIS

Colombia and Mexico both started to formally considered e-government implementation as an important issue at the middle of the 90s. These cases show several differences regarding their institutional and organizational structures. Table 1 show some general features of each country in comparison. While Colombia has been traditionally a country with hierarchical and centralized governmental structures, Mexico presents more decentralized structures that sometimes are difficult to coordinate and set collaboration across agencies at all levels of government. The e-government development index also shows different paths between Colombia and Mexico (see Figure 3). These differences also represent different challenges over time for their corresponding government's organizations and institutions in adopting e-government initiatives.

Table 1. Comparative general characteristics of cases

	Mexico	Colombia
Official language	Spanish	Spanish
Number of states/departments	31 <sup>[26]</sup>	33 <sup>[25]</sup>
Number of municipalities	2,461 <sup>[26]</sup>	1,103 <sup>[25]</sup>
Total Population (Est. 2011)	113,724,226 <sup>[26]</sup>	44,725,543 <sup>[25]</sup>
Facebook Users (2011) <sup>[18]</sup>	26,770,300	14,631,600
Twitter Users (2011) <sup>[11,34]</sup>	2,101,340	602,199
Average hours in social networks visits / month (2011) <sup>[6]</sup>	5.3	7
Broadband subscribers per 100 people (2011) <sup>[45]</sup>	10.21	6.94
Internet Users per 100 people (2011) <sup>[10,17,45]</sup>	36.2	40.4

Source: Own preparation from different sources.

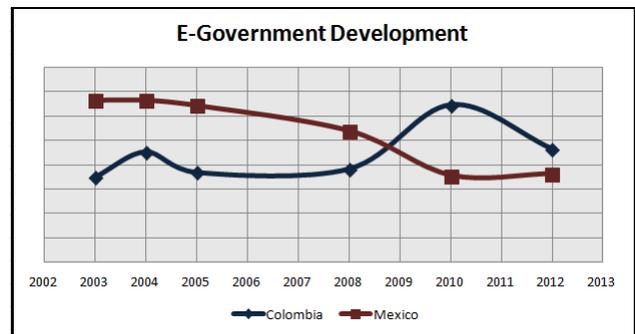


Figure 3. Source: Own elaboration based on the UN E-Government Surveys and Readiness Reports

### Stage 1

During this stage, Mexico and Colombia suffered from similar conditions as a wide digital divide and lack of proper knowledge and skills that prevent them to fully benefit of a successful adoption of e-government.

**Objective information technologies:** At this stage, Colombia and Mexico both employed basic technologies and had limited internet access and few government web portals. One of their achievements was that both nations managed to created electronic procurement systems. Colombia noticed the need of providing technological infrastructure, proper contents, government intranet and a web portal to offer information and services to citizens; while Mexico focus its efforts in the development of tools for devising a network of digital center, developing websites and applications to support specific public programs.

**Institutional Arrangements:** The a formal Connectivity Agenda (2000) included several programs designed to solve the problems related to the use of ICTs in Colombia based on tools and indicators to conduct diagnosis and monitoring of current situation of e-government projects. The agenda contained visual aids and friendly formats. Mexico developed the IT Development Program 1995-2000, which also diagnosed the situation of the country regarding ICT's and contemplate several goals and action lines. This program included several projects, but still no formal e-government strategy and monitoring mechanisms were promoted from the executive. Another important legal institutional arrangement in Mexico was the Electronic Declarations Legislation Package (1998).

**Organizational forms:** The central Colombian Government established well defined roles to involve agencies using a compliance system for its Connectivity Agenda. The control of this Agenda rested on the Presidency and the DNP (National Planning Department of Colombia), with the participation of the Ministry of Communications. The ministries, departments and affiliated entities were involved in the e-government program by developing websites and other ICT tools. The Mexican government gave certain level of flexibility because the agenda was set by the entity called INEGI (Institute for Statistics, Geography, and Informatics) that was in charge of controlling the federal IT policy and evaluation of actions across agencies and entities of the federal, state and local governments. Professional, academic and business institutions also participated but with the INEGI's level of authority. The program paid special attention to the development of networks and systems that facilitate the interaction between government agencies and some stakeholders. Issues of low coordination and inequality of political and financial support were present in this period in Mexico.

**Enacted technology:** Mexico and Colombia, both agreed that the provision of adequate skills and training for ICT's use to the population in general was a vital issue to treat. Even though both countries strategies considered members of society and public sector, the Colombian approach resulted more inclusive and direct than the Mexican one (more closed to demands). One of their best practices was to developed contents to promote the Colombian culture using online tools; while Mexico's government limited to use internet as a secondary extension of their social communication area. Mexico's scope contemplated the promotion of ICT's among society and private organizations, but was mainly centered on the technological development within the same government and its administrative tasks. The development of information systems and statistics was also one of their priorities, probably caused by the role of INEGI as coordinator of e-government initiative.

**Outcomes:** Colombia achieved different outcomes, but the most remarkable ones were the establishment of an innovating evaluation system, high coordination between institutions, and a huge progress regarding transparency and accountability. Mexico had also a cost reduction and a noticeable modernization of government systems, but more from the back-office side than from the service or citizen perspective. It also achieved paperwork reduction, process simplification and international acknowledgment for the e-government tools developed at the time.

## **Stage 2**

**Objective Information Technologies:** At this stage, Colombia and Mexico designed information systems to perform administrative formalities online (SUIT and Tramitanet), and established formal

government web portals that worked as search engines to access government procedures and data. In Colombia, the unique Hiring Portal (2003) and a government intranet were implemented. Mexico designed an improved version of its procurement program (Compranet Plus), implemented the electronic signature, and designed a web portal that allowed public officials to report their personal financial position (Declaranet). Fox's administration was concerned about the current technological infrastructure, so decided to install digital community centers across the country. Fox also considered the development of specific content.

**Institutional arrangements:** Colombia maintained a Connectivity Agenda and consolidated the *Government Online Strategy* (2002). Among the more relevant Colombian legal institutional arrangements, were the approval of the Public Administration Reform (Law 790 of 2002) and the Anti-paperwork Policy (Law 962 of 2005). In Mexico, president Fox considered the e-government development as a national priority, and therefore included it as a pillar of his presidential Good Government Agenda (2002). The IFAI (Federal Institute of Access to Public Information) was established and the e-Mexico program was launched. The e-Commerce Legislation (2000), the Federal Law of Transparency and Access to Public Information (2002), the Data Protection and Electronic Signature Initiative (2002), and the Civil Service Career Law (2003) were also enacted t this time.

**Organizational forms:** In Colombia, the Ministry of Communications took the formal role of coordinator over the Connectivity Agenda program. The Coinfo chaired by Colombia's Vice President was established. At this stage, the Mexican e-government formal strategy was coordinated by the Comptroller's Office, which was also in charge of the e-Mexico initiative, an important political tool to achieve the success of the technological implementation, involving state and local governments and a number of different participants from government and society.

**Enacted technology:** Colombia e-government strategy encouraged the participation of all the levels of government in the e-government culture and improved its coordination, higher levels of communication across agencies and a wider offering of online data and services to citizens. The promotion of this strategy across Colombia was very important in order socialize the potential benefits of this project. In Mexico, the e-government strategy was also more centered on citizens. One of its biggest contributions was a wider offering of online services and contents.

**Outcomes:** The main outcomes in the Colombian case were higher levels of governmental transparency, efficiency, coordination, and online offerings. As for the Mexican case, the outcomes included higher accessibility for specific population segments, higher citizen participation, more transparency in the political culture, and an improvement of internet security.

## **Stage 3**

**Objective information technologies:** Mexico's federal government took care of the optimization of the official government web portal and search engine ([www.gob.mx](http://www.gob.mx)), and created an e-license system (Concilianet). It promoted the use of social media, Web 2.0 applications, smart-phones applications and web contents by federal institutions. Colombia continued to strengthen its methodology for monitoring and evaluating websites.

**Institutional arrangements:** In Colombia, the Online Government Program was consolidated with the Presidential Decree 1151 (2008). A series of evaluations of the strategy were performed

every year. In Mexico, Calderon's administration addressed several legal issues and implementation obstacles.

**Organizational forms:** In Colombia, a higher integration collaboration and coordination between agencies was achieved. The Connectivity Agenda program was still part of the Ministry of Communications, which in 2009 became the Ministry of ICT. In México the Secretariat of Public Service was in charge of the e-government program. Social media started to connect citizens with government actors and institutions. A database integration project for national security agencies was the priority (Single Criminal Information System). Mexico still faced problems of low integration and interoperability among systems and processes.

**Enacted technology:** Colombia emphasized the use of technologies for educational purposes. Mexico improved the inter-institutional collaboration, and started to use social media as a mechanism to promote citizens participation.

**Outcomes:** Transparency and information access was increased in Colombia. An improvement on government service delivery to citizens and businesses was registered in this stage. Colombia also obtained favorable ratings on e-participation and managed to reduce its digital divide. Mexico achieved the processes and legal framework for deregulation, inter-agency coordination and services offerings based on ICT tools (21% of the government services were provided online).

#### 4. CONCLUSIONS

(1) An integrated approach with technological aspects but also cultural changes

(2) Use of normative tools and clear application methods have helped to maintain a common language between the different actors.

(3) Support from the Executive and the Ministry of Information Technology and Communications.

(4) Be more attentive to the needs and demands of the citizens.

(5) Legal framework and the interconnectivity across agencies.

(6) Structural problems such as digital divide, poor technological infrastructure, low inter and intra institutional coordination, and complex, saturated and inadequate legal frameworks.

#### REFERENCES

- [1] Aguilar-Villanueva, L. F. El aporte de la Política Pública y de la Nueva Gestión Pública a la gobernanza. *Revista CLAD Reforma y Democracia* No 39. Caracas: Oct. 2007. DOI=<http://www.clad.org/portal/publicaciones-del-clad/revista-clad-reforma-democracia/articulos/039-octubre-2007/0057201>
- [2] Chevallier, J. 2011. *El Estado posmoderno*. Traducción Oswaldo Pérez. Bogotá: Universidad Externado.
- [3] CLAD. *Gestión Pública Iberoamericana para el siglo XXI*, aprobada por la XL Reunión Ordinaria del Consejo Directivo del CLAD. Santo Domingo, República Dominicana, (November 8-9) 2010, p. 5 DOI=<http://www.clad.org/documentos/declaraciones/gestion-publica-iberoamericana-para-el-siglo-xxi/view>
- [4] Comscore. 2011. DOI=<http://www.comscore.com/2011/06>.
- [5] ECLAC. System statistics on ICT. OSILAC estimations based on household survey in each country. DOI=<http://www.eclac.cl/cgi-bin> Data from February 1, 2012.
- [6] Ecualink. *Uso y penetración de Twitter*. 2011. DOI=<http://www.ecualinkblog.com/2011/04/datos-twitter-latinoamerica-2011.html>
- [7] European Commission. 2010. *The European e-Government Action Plan 2011-2015. Harnessing ICT to promote smart, sustainable and innovate Government*. Brussels, COM 2010 743.
- [8] Fountain, J. E. 2001. *Building the virtual state: Information technology and institutional change*. Washington, DC: Brookings Institution Press.
- [9] Gil-garcía, J. R., Mariscal, J., and Ramírez, F. 2008. *Gobierno electrónico en México. Documento de Trabajo de la División de Administración Pública del CIDE*, (214). DOI=<http://libreriacide.com/librospdf/DTAP-214.pdf>
- [10] Gil-García, J. Ramón, and Luis Felipe Luna-Reyes. 2006. *Integrating conceptual approaches to e-government*. *Encyclopedia of e-commerce, e-government and mobile commerce*. 636-643.
- [11] International Telecommunications Union DOI=[www.itu.int/ITU-D](http://www.itu.int/ITU-D) Data from February 1, 2012.
- [12] Internet World Stats. *LAC Internet Usage Statistics* DOI=<http://www.internetworldstats.com/stats10.htm> Data from February 1, 2012
- [13] National Administrative Department of Statistics (DANE). Colombia.
- [14] National Institute of Geography and Statistics (INEGI) of Mexico.
- [15] OECD 2005. *OECD e-Government Studies: Mexico 2005*.
- [16] Puron-Cid G. and Gil-García *Gobierno Abierto, Tecnologías de Información y Análisis de Políticas Públicas: Oportunidades y Retos para América Latina y el Caribe*. *Revista CLAD* 2013, 55
- [17] Rubino-Hallman, S., and Hanna, N. K.. *New technologies for public sector transformation: A critical analysis of e-government initiatives in LAC and the Caribbean*. *Journal of E-Government*, 3(3), 2007. 3-39. DOI=[http://www.tandfonline.com/doi/pdf/10.1300/J399v03n03\\_02](http://www.tandfonline.com/doi/pdf/10.1300/J399v03n03_02)
- [18] Schellong, A. 2007. *Extending the Technology Enactment Framework* (pp. 1-9). PNG Working paper No PNG07-003, Program on Networked Governance, John F. Kennedy School of Government, Harvard University. DOI=[http://www.hks.harvard.edu/netgov/files/png\\_workingpaper\\_series/PNG07-003\\_WorkingPaper\\_extending\\_technology\\_enactment\\_framework\\_schellong.pdf](http://www.hks.harvard.edu/netgov/files/png_workingpaper_series/PNG07-003_WorkingPaper_extending_technology_enactment_framework_schellong.pdf)
- [19] United Nations. *E-Government Survey*. New York. 2008.
- [20] United Nations. *E-Government Survey*. New York. 2010.
- [21] United Nations. *E-Government Survey*. New York. 2012.
- [22] United Nations. *Global e-government readiness report*. New York. 2004
- [23] United Nations. *Global e-government readiness report*. New York. 2005
- [24] United Nations. *Global E-government Survey 2003*.
- [25] World Bank. *Development Indicators*. DOI=<http://data.worldbank.org/indicator>.