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Collaborative Digital Government in Mexico: Some Lessons from Federal Web-Based Inter- Organizational Information Integration Initiatives

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ABSTRACT

The use of information and communication technologies in government has been characterized as one powerful strategy for administrative reform. From recent experiences around the world, it seems clear that in order to achieve some of the most prominent benefits of digital government the integration of information across organizational boundaries is necessary and these projects have been called “collaborative digital government”. However, these collaborative digital government initiatives face additional challenges, since many times, the required level of inter-organizational collaboration and trust is not supported by the existing institutional arrangements and management structures. In fact, many institutions found in government contexts offer incentives for single-agency work only, which produces stove-pipe systems. Based on an extensive case study in the Mexican federal government, this paper explores how certain institutions can enable or hinder cross-agency collaboration and consequently, inter-organizational information integration.

Keywords

Digital Government, E-Government, Collaboration, Inter-Organizational, Project Evaluation, Technology Enactment.

INTRODUCTION

“Collaboration or Failure,” is the front page heading of the February-March 2006 number of *Política Digital* (Digital Policy), a practitioner oriented magazine of National distribution in Mexico. The heading constitutes the reaction of the magazine’s executive editor to 51 Chief Information Officers (CIOs), policy makers and project managers “visions” about the future of electronic government (eGov) in Mexico, published on the same magazine. Each of these 51 short articles expressed the need to collaborate to offer integrated services to the citizen, achieving a true administrative reform and a better government. This need to collaborate is articulated in several ways, going from the need of standards to facilitate interoperability, to sharing information and technology resources, to create synergies in service offerings, software re-use and back-office integration, and to create measurable social and economic impacts.

This shared vision about the need to collaborate, responds to the experience of a group of leaders who have been building collaborative digital government initiatives in Mexico during the last five years. However, the need to collaborate in the development of eGov projects goes beyond the local experience of these managers, and appears to be a worldwide trend (Gant, 2003b). Although the use of collaborative approaches is appealing in many senses to managers, taking them into practice is not as common as it could be expected (Bardach, 1998; Gray, 1989). It can be argued that managers do not use this kind of approaches because the lack of models that help them to understand and manage collaboration among several agencies or organizations (McCaffrey, Faerman and Hart, 1995). Collaboration is a complex and dynamic phenomenon (Black, Carlile and Repenning, 2004) which is usually related to other dynamic concepts such as trust and engagement (Mattessich, Murray-Close and Monsey, 2001; Vangen and Huxham, 2003).

The purpose of this paper is to explore the relationships among trust, collaboration, and the institutional and organizational environments in which these processes are embedded in inter-organizational digital government initiatives. To accomplish

this purpose, we analyze digital government projects that involve the initial steps towards high levels of virtual integration and close collaboration among multiple government agencies in Mexico, particularly those associated with the e-Mexico initiative, an umbrella project that has brought together the Ministries of Communications and Transportation, Public Administration, Health, Economy, and Education, as well as many other public agencies, private sector organizations, and non-profits in an effort to create a more effective government, provide better public services and a connectivity infrastructure to support access to these services.

Thus, the main contribution of the paper is to explain the role of collaboration, trust and government institutions in complex inter-organizational e-government projects. It also provides necessary knowledge about potential benefits and challenges in different institutional and social contexts such as Latin America, which is scarce in the digital government literature. Some of the particular challenges of developing countries include the lack of appropriate technological and human infrastructures, the lack of an adequate institutional environment, and the lack of relevant content in the local language to create significant social impact.

The paper is divided in six sections including this introduction. Section two includes a review of the literature on institutions and collaboration. Section three and four consist of a description of the methods used and a brief description of the case respectively. In section five, we discuss the e-Mexico case in terms of the collaboration and the institutional factors involved in the interorganizational projects developed in the last few years. Finally, we conclude with an initial framework that links institutions and collaboration in e-Government projects. Therefore, it describes the e-Mexico experience, its main results, and the models of collaboration and related institutions that have produced the initial encouraging results. We will also describe the main constraints and challenges to the process in order to contribute to a better understanding of the phenomenon of collaboration and integration.

COLLABORATION AND INSTITUTIONS IN DIGITAL GOVERNMENT INITIATIVES

Digital government has been considered a powerful strategy for administrative reform (Fountain, 2001; Heeks, 1999; Kramer and King, 2003). In fact, there are plenty of examples of governments attempting to transform their governmental structures and improve the quality of the services they provide through the use of information and communication technologies (OECD, 2003). Projects looking for benefits on service quality or more effective and efficient government programs face a great number of technical, organizational, and institutional challenges (Fletcher, 2002; Fountain, 2001). As the organizational complexity of the project increases, and more agencies collaborate and share information, both potential benefits and challenges also increase (Caffrey, 1998; Dawes and Pardo, 2002; Fountain, 2001). Previous research has found that trust and collaboration are success factors in government Information Technology (IT) projects in which multiple organizations are involved (Black, Cresswell, Pardo, Thompson, Canestraro, Cook, Luna-Reyes, Martinez, Andersen and Richardson, 2003; Luna-Reyes, Mojtahedzadeh, Andersen, Richardson, Pardo, Burke, Wu, Cresswell, Bodor, Canestraro, Dawes, Demircivi, Schneider and Thompson, 2004).

Collaboration is a phenomenon that takes place in a specific context. Social actors have incentives to collaborate or not and, at least in part, these incentives are embedded in the institutional arrangements and management structures of government (Gant, 2003b; Gil-García, 2005). Therefore, it is important to understand how different institutions affect the development of collaboration and trust, and subsequently the results of collaborative digital government projects. This section presents an analytical framework that is used to understand the relationships between collaboration, trust, information technologies, and institutions in government settings.

Collaboration in Digital Government

Inter-organizational partnerships are widely recognized as a powerful strategy to improve public sector initiatives, but the design of such programs requires intense collaboration and the appropriate institutional environment (Dawes and Pardo, 2002; Gant, 2003a, 2003b). Collaborative digital government projects have several commonalities (Dawes and Pardo, 2002). Many times, they constitute initiatives originated by problems of a single government agency that generate a necessity to collaborate. They require the integration of diverse sources of information, an element that poses both technical and organizational challenges. Participating agencies will face the technical challenge of promoting communication among different information systems, created in different architectures and formats. They will also face the challenge of collaborating with the owners of these data --across their organizational boundaries-- in order to share information resources and develop the new system.

The processes of negotiation and collaboration are common to many Information Technology projects. Negotiation here is not associated with the connotation used within the literature on positional bargaining, but to the “conversational interactions among collaborating parties as they try to define the problem, agree on recommendations, or design action steps” (Gray,

1989, p. 25). This collaboration process is complicated to manage, and it is harder to manage in most public sector projects, given the diversity of perspectives, objectives, values, and cultures among project participants (Dawes, 1996; Dawes and Pardo, 2002), and given that IT projects in the public sector have an important political component (Andersen and Dawes, 1991).

A common model explaining collaborative relationships involves a virtuous cycle involving trust, willingness to collaborate, and work done (Vangen and Huxham, 2003). This virtuous cycle, however, has the potential to become a trap during the early stages of any project, where there is no progress or work done, and there is little trust among participants. If we understand collaboration as a process in which several agencies create a shared vision about a problem (Gray, 1989; Mattessich et al., 2001), trust becomes a key factor to bring people to the project table, and also to facilitate the knowledge sharing process involved in building a shared vision of the project (Levin, Cross and Abrams, 2002; Shapiro, Sheppard and Cheraskin, 1992).

Trust has been considered as an alternative governance mechanism (alternative to price and authority) in most collaborative relations (Creed and Miles, 1996; Good, 1988; Kumar, van Dissel and Bielli, 1998; Powell, 1996; Tyler and Kramer, 1996; Zaheer, McEvily and Perrone, 1998), but especially important in network environments (Creed and Miles, 1996; Heimer, 2001; Sheppard and Tuchinsky, 1996). Some researchers have also discussed the importance and problems associated with the development of trust in inter-organizational collaborations in the public sector (Bardach, 1998), as well as in cases where government collaborates with nonprofits to offer a service to the public (Schwartz, 2001).

Researchers have identified several mechanisms of “trust production.” In a review of the literature, Rousseau and her colleagues (1998) –for example—distinguished three mechanisms associated to trust development: relational trust, calculative trust, and institutional trust. Institutional trust refers to the existence of an institutional framework that regulates the relationship between the main actors in the collaboration. Calculative trust refers to an estimation of the risks and pay-offs intertwined in the interaction. Changes in the perception of the institutional framework can result in changed perception of risk, promoting increases in calculative trust. Finally, relational trust is associated with emotional bonds, shared values or objectives between the actors, or recognition of benevolence, ability, and integrity of other participants in the collaboration.

As suggested by a recent discussion in the information systems (IS) community, institutional trust mechanisms appear to be particularly relevant in IS research (Gefen, Pavlou, Benbastat, McKnight, Stewart and Straub, 2006), and we believe that these institutional mechanisms can be better understood by considering research on institutions and institutional theory. In this way, the following section summarizes the main elements of institutional theory, and its application to IS research and IT projects.

Information Technologies and Institutions in Government

Institutional theory has been very useful in understanding organizational settings (Powell and DiMaggio, 1991; Scott, 2001). Scholars from different disciplines, such as economics (Rutherford, 1999), sociology (Brinton and Nee, 1998), and political science (Peters, 2001) have developed institutional frameworks to understand diverse social phenomena. Institutions can be seen as guidelines for action, but also constraints on those actions (Scott, 2001). Information technology initiatives involve a complex set of decisions and interactions. These interactions are constrained by institutional arrangements, but at the same time institutions “frame how those constraints operate.” (Fountain, 2001). Therefore, institutions also influence the specific constraining mechanisms. Scott (2001) proposed that institutions are supported by what he conceptualized as three pillars: the regulative pillar, the normative pillar, and the cultural-cognitive pillar. Some institutions are mainly representations of one of these pillars, but the pillars are not necessarily independent and other institutions can be supported by more than one pillar.

Previous research has used institutional approaches to understand information technologies in government settings (Bellamy and Taylor, 1996; Butler, 2003; Fountain, 1995, 2001; Laudon, 1986). Institutional theory “offers students of technology a less constrained vantage point from which to examine the role of macro-social forces.” (Barley, 1990, p. 62). This is because institutionalism has the potential not only to identify power structures and their alignment to technological systems, but also to suggest some modifications to the institutional environment that might affect both organizational structures and technological features. Institutional theory can help explain how information technologies influence organizational and institutional arrangements, as well as how these arrangements affect the way information technologies are selected, designed and used.

One of the most comprehensive institutional frameworks to study information technologies in government settings is the technology enactment theory, which attempts to explain the effects of organizational forms and institutional arrangements on the information technology used by government agencies. According to Fountain (1995, 2001) the technology enactment framework pays attention to the relations among information technology, organizations, embeddedness, and institutions.

According to the enacting technology framework, objective information technologies are in some way modified by organizational and inter-organizational factors to become enacted technologies. Therefore, the enacted technology can be represented by the technological features of the current system and the way in which different users take advantage of those technology characteristics (Laudon, 1986; Puron Cid and Gil-García, 2004). This is consistent with findings from other studies of public sector information systems (Kraemer, King, Dunkle and Lane, 1989). Both organizational characteristics and institutional arrangements have an impact on the enacted technology.

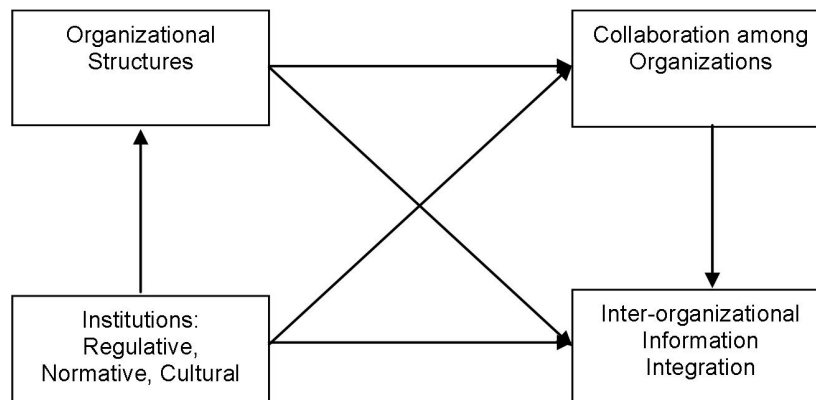


Figure 1. Effects of Institutions on Collaborative Digital Government

This paper argues that institutions and organizational structures shape not only the enacted technology, but also other processes and results of government IT projects (see Figure 1). For collaborative digital government initiatives, one of the most important processes affected by institutions is the trust among key participating agencies, which in turn promotes or limits the willingness to collaborate. Then, through examples from a federal overarching digital government initiative in Mexico, the paper shows how several of these factors are embedded in the government institutional environment.

METHODS

This study is part of a research project that follows a multi-method approach, which involves semi-structured interviews to project leaders and participants of more than 15 digital government initiatives in Mexico, a survey to project participants, and three in-depth case studies (Creswell, 2003; Yin, 2003). The objective of this design is to understand some of the mechanisms and results of collaborative digital government in Latin American contexts. It will also provide some evidence of the similarities and differences between Latin American and other countries, regarding inter-organizational information integration in government settings.

This paper reports on the findings from interviews and document analysis from the Mexican Digital Government Strategy. Specifically, the results reported here are based on extensive analysis of documentation and 18 semi-structured interviews with public managers involved in the implementation of collaborative electronic government projects. Interviewees include project managers and CIOs from the ministries of Communications and Transportation (3), Public Administration (3), Economy (1), Health (1), Education (1), Finance (2), Justice (1), as well as other federal agencies such as the Social Security Institute (1), the President's Internet System (1), the Institute for Access to Information (2), and the National Savings and Financial Services Bank (1). We included an additional interview with staff from INFOTEC, a public center for innovation, which has played an important role in the development and implementation of the Mexican Digital Government Strategy.

Interviewees were asked questions about the characteristics of their projects, the institutional environment, projects' cost and benefits, their perceptions of project success, collaboration and networking. The research team analyzed the interviews looking for themes and categories that emerge from the data. One prominent theme was collaboration and its relationships with the institutional environment and managerial structures in inter-organizational digital government initiatives. Documentation analysis was used to enrich the contextual description and triangulate findings from the interviews. Documents such as the National Plan for Development, the Good Government Agenda, the e-Mexico strategy, and documented case studies from some projects were collected and analyzed.

BRIEF DESCRIPTION OF THE CASE

The National e-Mexico system is an "umbrella" initiative oriented to develop government services and applications for the Mexican society. The mission of e-Mexico is to "be an agent of change in the country, integrating efforts from diverse public

and private actors in the elimination of the digital divide and other socio-economic differences among Mexicans, through a system with technical and social components to offer basic services on education, health, commercial interchange, and government services, being at the same time leaders in Mexican technological development” (e-México, 2003b).

President Fox administration has assumed as one of its main objectives the impulse of ICT use among Mexicans to provide universal access to information, knowledge and government services as a strategy to create a more democratic and participative society where economic and social benefits are better distributed (e-México, 2003a).

The project started as a direct initiative of President Fox, who in his initial address to the Nation on December 1st, 2000 instructed the Minister of Communications and Transportation to start the initiative:

“I instruct the Minister of Transportation, Pedro Cerisola, to start as soon as possible the e-Mexico project, so the information and communications revolution acquires a truly national character, reducing the digital divide among governments, private organizations, households and individuals, reaching up to the last corner of our country.”

E-Mexico strategy is organized around three main “axes” or lines of action, and with a value-oriented and collaboration focus. The purpose of these three main axes is (1) to create infrastructure that allows citizens to connecting to the Internet, (2) to produce relevant content, and (3) to develop a technical architecture for government. The focus on value creation and collaboration is reflected in the coordination nature of e-Mexico. In fact, the e-Mexico program, together with other policies like the Good Government Agenda, have pulled together the efforts from the Ministries of Communications and Transportation, Public Administration, Health, Economy, and Education to lead other federal agencies, private actors and non-profits in building the foundations for integrated, interoperable government services.

In general terms, this digital government strategy has been successful. Participating agencies have coordinated the deployment of 7,200 Digital Community Centers (DCC) with Internet access to bridge the digital divide. The e-Mexico portal contains more than 7,000 web pages organized in about 15 content portals. Under the coordination of the Ministry of Public Administration, federal agencies have also collaborated in the creation of a governance structure for Digital Government in Mexico. According to participants in the e-Mexico project, they have accomplished about 95% of the objectives stated at the beginning of President Fox Administration. According to surveys about Internet use, and the expert opinion of some of the marketing companies developing the surveys, e-Mexico has had an important impact in Internet penetration in Mexico. Four out of the 17 million people connected to the Internet does so through a DCC. That is to say, about 25% of the current users of Internet in Mexico are to certain extent a direct impact of the e-Mexico program. Finally, several e-Government projects in Mexico have earned international awards because of its innovative approaches and quality.

ANALYSIS AND DISCUSSION

After describing some important aspects of the e-Mexico case, this section of the paper starts describing the collaborative approach followed in the digital government strategy in Mexico. After the description of inter-agency collaborations in e-Mexico, we highlight some of the institutional arrangements and management structures that have influenced the quality of the collaborative relationships, the levels of trust, and the overall results of the initiative.

Collaboration and Value Creation

E-Mexico has been since its beginning a collaborative process, and it is reflected in the network of agencies involved in the digital government project in Mexico (Figure 2). The E-Mexico Coordination, which resides in the Ministry of Communications and Transportation, works closely with the Ministries of Economy, Education, Health, and Public Administration. In the last couple of years, many other agencies and organizations had shown interest in developing specialized content portals for communities such as the native Mexicans, the community of emigrants to the United States, women or people with disabilities.

The Ministry of Public Administration works in close coordination with the agency-wide IT units at the federal level. Much of the coordination work has been done with the participation of Ministers and Chief Information Officers (CIOs) in an e-Government network. The main objective of the e-Government Network was to share experiences, and to promote coordination among federal agencies in terms of investments or common projects. The network, for example, promoted (1) a joint licensing agreement with Microsoft involving all Federal Agencies and (2) the adoption of standards to facilitate database interoperability.

Given the initial results in terms of savings and as a result of current practices research, the e-Government Network evolved into an E-Government Inter-ministerial Committee last December. The committee, as well as 19 subcommittees around it has

the objective to develop policy associated to important themes such as security, software, IT function organization, electronic signatures, and control.

As described by one participant, the e-Mexico Coordination is mainly in charge of continuous government services and information related with health, education or economic development, while the Ministry of Public Administration is mainly working in the development of discrete electronic services such as getting licenses or permits. As mentioned in previous sections, INFOTEC has given technical support, as well as information from best and current practices research and technological trends, functioning as a consultant, and as a partner in the development of some Internet applications.

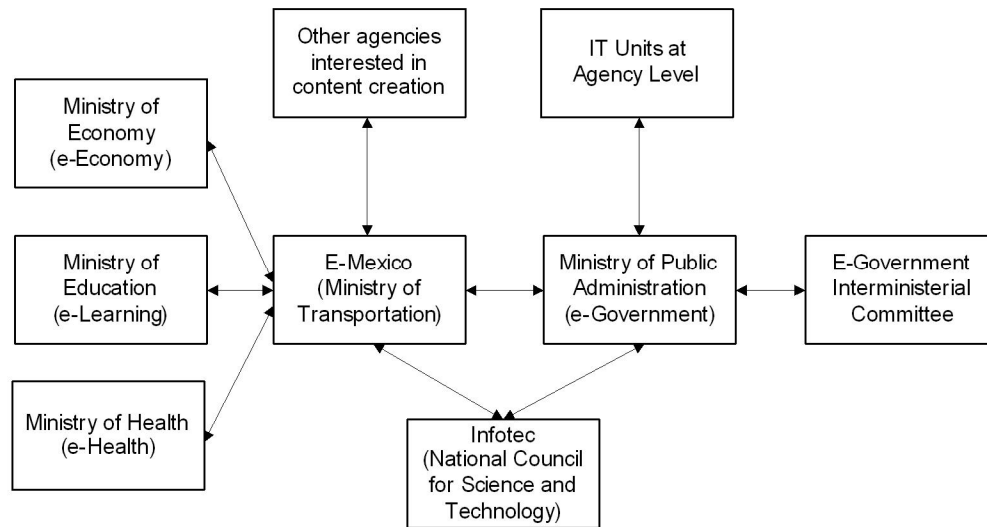


Figure 2. Network of relationships around the e-Mexico System and Digital Government in Mexico.

Efforts inside the e-Mexico coordination have brought the change in focus from a vertical, hierarchical approach to a value-oriented more horizontal model. One of the participants mentioned that one of their main lessons was about working together horizontally,

“The first thing we found out was the need to work together. It could not be done piece by piece, but we had to do something strange. That is, instead of creating a new Ministry or a new National Institute, we had to align the process horizontally with the people in charge of doing it... and we thought that to do it, we had to focus in three great areas [...] So, e-Mexico could have been born as a new entity, but the idea was to do it with the existing structures, asking people to do the things they had to do, and coordinating and aligning efforts from organizations and agencies working the same topic.”

Another important characteristic of the e-Mexico model that emerged from its horizontal nature was the change from a hierarchical approach to a value model, where any interested agency can approach with project ideas, increasing the probability of project success. Other participant commented,

“The advantage of a value-based model is that people looks for us when they are interested in doing something, and then things get done. I am not in the hierarchy above them, and that’s perfect, because we are understanding for the first time in Mexico the meaning of collaboration among powers.”

As one other participant commented “the beauty of this is that we can do a lot with 13 people in the structure of middle- and high-level managers, and about 25 unionized personnel. So, the ratio of the administrative cost compared to the total budget was just 3.6% last year.” In addition, the coordination, planning and implementation of any project follows a four-step process, which involve cross-boundary collaboration: Digital Participation, Strategic Planning, Project Management, and Operation. Digital Participation involves the inter-institutional relationships with ministries, agencies and other organizations. Strategic Planning involves the development of an assessment of the costs, social impact and alignment of any new project. After project approval from an Endowment Technical Committee, the Project Management process involves the development and deployment of the new system or portal. Finally, the Operation stage involves application maintenance, which in many cases goes back to the ministry, agency or organization which proposed the project at first.

Although there has been strong collaboration between the e-Mexico team and the Ministry of Public Administration group, the e-Government Interministerial Committee has had a limited impact on developing a Federal-wide IT strategy. In fact, as one of the interviewees commented, “Each agency decides its own priorities, and negotiate them directly with the President’s Office.”

Institutional and Organizational Factors

Laws, regulations, and written government policies have had an impact on the evolution of the e-Mexico system and Digital Government in Mexico. The program itself started as a personal charge from president Fox to the Ministry of Communications and Transportation. In fact, all interviewees recognized the President’s support to e-Government as a key factor in the initial success. The initial enthusiasm of the group involved in the e-Mexico system was also pushed by the creation of the Ministry of Public Administration. Moreover, the efforts of many other agencies added to these two ministries because of the Good Government Agenda, which is oriented to promote e-Government in the Federal Government.

However, institutional factors have had also negative impacts on e-Government in Mexico by slowing down some of the initiatives. For example, the influence of the Ministry of Public Administration was limited at the beginning because they did not have control of the information policy in the country. Most public managers interviewed also mentioned the need of a much better regulatory environment. As one of them said “if the regulation says that you need to present the original deed of a property as part of the paperwork for a government service... well you have to do it.” Another one commented that in some applications such as tax payments, the systems have to be complex because the tax law was highly complex. Although some important regulations have been created, such as the Access to Government Information Act, some of the participants commented “legislators are not in complete ‘synchrony’ with digital government,” making the process slow, or even creating new legislation that makes digital government implementation more complicated.

The political environment in Mexico poses a potential risk for the entire digital government program. Several of the interviewees showed some uncertainty related to the presidential succession that will take place in July, 2006. Some others are confident because most of the infrastructure elements of the program are outsourced, and the contracts do not expire in 2006. Group efforts have pushed the formal creation of the E-Government Inter-ministerial Committee, which started meeting well before it was formalized. This informal network contributed to the creation of the Governance structure present in the Committee. An interesting norm that has emerged during the last few years is the project identification and management process created jointly by the e-Mexico Coordination and Infotec. As some of the participants commented, this relationship was not planned, but it has produced a useful strategy to develop and test web portals and other systems. However, other norms created inside centralized government agencies such as the Minister of Communications and Transportation have created some problems. For instance, there have been some conflicts between this highly hierarchical ministry, the decentralized educational system, and the professional-oriented health system.

Finally, other important factors for the success of the program are related with shared meanings created in the community working on digital government. They share the belief that their work is truly associated with the creation of a more democratic society, and a more transparent government, which positively influence collaboration efforts. Most of them have a commitment to do their homework, being aware of current and best practices inside the country and abroad. Moreover, they recognize that these practices are guidelines that have to be adapted and tested based on the specific institutional environment of the country. In addition, many of them recognized power relations, individual priorities, agency control over resources, and long bureaucratic processes for the approval of some initiatives as important barriers to collaborate.

Although none of the public managers interviewed spoke directly about the importance of trust in the projects, most of them described themes associated with the modes of trust production. Many of them talked about the importance of being clear and truthful when describing project benefits and costs, being sensitive about particular agency needs creating value for them, clearly identifying risks, and showing results fast. From the interviews it was clear that trust was a key factor for the development of the necessary collaboration among organizations and people.

FINAL COMMENTS: UNDERSTANDING COLLABORATION AND INSTITUTIONS

We have described in this paper the main institutional characteristics and collaborations involved in the initial Mexican efforts to create the basis for interoperable e-Government and Information Integration among several federal agencies. The current results, although encouraging, constitute only the basis of a fully integrated e-Government system. Although the experiences described here show only these initial efforts, it is possible to identify important relationships between institutions and collaboration. In fact, the previous section shows how different institutions (regulations, laws, norms and culture) have promoted or hindered the collaboration among organizations and people.

As shown in Figure 3, *collaborating in projects* is the result of initial *trust*. Managers in these projects have promoted this initial trust by clearly establishing potential *benefits* and *risks* from the projects. Moreover, by getting fast results and *progress in integration*, they have further clarified the expected *benefits* increasing the level of trust, and further promoting collaboration. Regulations, laws, shared meanings, organizational structures and other *institutional arrangements and organizational structures* contribute to the initial trust by providing (or not) a safe environment and thus decreasing the perception of *risk*. *Progress in integration* also pushes the creation or modification of *organizational structures and institutional arrangements* by promoting new meanings about ways to collaborate or proposing new legal and regulatory frameworks.

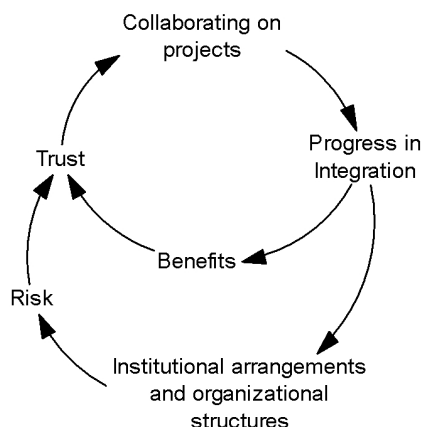


Figure 3. Initial Framework Explaining Relationships between Institutions and Collaboration.

This initial framework inferred from the Mexican experience, is consistent with relationships already present in the literature about institutions, collaboration and trust, and it is susceptible of further empirical investigation. In the case of e-Mexico, new institutional arrangements and management structures were created to promote collaboration and the development of inter-organizational e-government projects. This was possible, at least in part, because a new federal administration was starting and the new President openly supported this project. This was also possible, because many of the public managers involved in e-Mexico truly believe in the value of information technologies for delivering public services and reducing the digital divide. Future studies should explore if this virtuous cycle can be started in different institutional contexts and at a different political timing. On the other hand, e-Mexico is a huge umbrella project that involves many public, private and nonprofit organizations and attempts to have an integral approach (supply and demand) to the e-government phenomenon. Future research should investigate if similar dynamics between collaboration, trust and institutions, can be found in more traditional (supply only) e-government initiatives.

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