Enacting State Websites: A Mixed Method Study Exploring E-Government Success in Multi-Organizational Settings

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Abstract

E-government is increasingly been used for government administrative reform. In fact, spending in e-government initiatives continues to rise and, among these projects, Internet-based applications are increasingly important. Using a nested research design, this study explores the complex relationships among the relative success of state websites and certain organizational, institutional, and contextual factors[1]. Based on a PLS analysis involving all 50 states and two rich case studies, this paper identifies several generalizable relationships and case-specific differences. For instance, organizational factors such as size of the IT organization, budget structure, IT training, in-house development, outsourcing, and marketing strategy were found to significantly affect the functionality of state websites. However, some of these factors play different roles in different contexts, their relevance is affected by state-specific environmental conditions, and the reasons why they are important also differ from setting to setting.

1. Introduction

Transforming government is a difficult task, and e-government seems to have the potential to promote administrative reforms [3, 27, 32]. Most citizens want to receive better public services [3], and information technologies seem to be a key component for the necessary improvement [10, 17]. Information technologies have the potential not only to improve the quality of services, but also to produce cost savings and make government policies and programs more effective [9, 21, 22]. Nevertheless, some scholars think information technologies (IT) in general and electronic government in particular have not yet accomplished the promise of a more efficient, effective, decentralized, and democratic public administration [7, 21]. In fact, Heeks [28] estimates that the failure rate of these projects could be as high as 85%.

Despite the high rate of failure, government spending in e-government projects has continually increasing in the last few years and was estimated to surpass $6.2 billion in 2005 [22]. Web applications and other Internet technologies are important components of this spending. Initially Internet technologies were mainly used for displaying information in public websites. More recently, governments started using the web for communication with the public and to provide online services to citizens, businesses and other users [9, 17, 19]. Currently, Internet technologies are used not only for the provision of information and services, but also to improve internal operations in government agencies. The development of intranets and extranets has grown in the last few years and more agencies are using web applications to interact with their employees and trusted partners through these restricted networks. In fact, government-to-government and government-to-business applications are projected to represent more than 60% of the overall e-government expenditure by 2005 [22].

The literature emerging today recognizes that there is a dynamic interaction between social structures and information technologies. However, little research has attempted to study information technology in government from this more comprehensive perspective. In addition, there is a limited understanding of the factors affecting how government uses information technologies, and how information technologies affect the way government works. Using a nested research design, this study explores the complex relationships among the relative success of state websites and certain organizational, institutional, and contextual factors. Accordingly, the overall purpose of this research is to contribute to the

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development of a theoretical framework to understand the complex and dynamic relationships between information technologies and social structures in government settings.

2. E-government success and state websites

Recently, several disciplines have developed important theoretical attempts to understand the complex relationships between information technologies and social structures. Initially, most of the research took a linear perspective and assumed uni-directional causality. For instance, either information technologies were seen to have the capacity to transform organizations and institutions, or organizational characteristics and institutional arrangements were seen as key in shaping the selection, design, and use of information technologies [24].

On the one hand, there is a well-developed literature that recognizes the transformational power of information technologies and their impacts on organizational structures and outcomes. In this tradition, there seem to be clear positive effects from using information technologies in organizational settings and there is a large body of research dedicated to identifying and analyzing these potential benefits. This study reviews different approaches to understanding e-government benefits [8, 29, 36, 38, 39]. These benefits from e-government initiatives are described as both modifications to current organizational structures and processes, as well as specific organizational outcomes such as improved service quality or increased policy effectiveness.

On the other hand, there is important research about the impact of organizational, institutional, and contextual factors on the selection, design and use of information technologies [2, 10, 20, 34, 35, 42]. This academic tradition attempts to understand how different factors affect or shape the resulting information technology and, subsequently the resulting organizational outcomes as measures of IT success.

Both approaches have contributed to our current understanding of information technologies in government. However, this study takes a more holistic approach to the e-government phenomenon in the states: an ensemble view. There are two main differences between other theoretical traditions and the theories that Orlikowski and Iacono [41] call the ensemble view of information technology and organization. First, for these ensemble-view theories, information technologies are not only the technological artifacts, but also the social and organizational structures around those artifacts. These social and organizational structures can be thought of as the factors and relationships around the technological artifact. In different specific theoretical models, the construct social structures may include individual, project, organizational, institutional, or environmental factors, as well as their interrelationships. Second, these theories argue that there is a dynamic and complex interaction between social structures and information technologies. Some examples of these more integrative theoretical approaches are structuration theory [11, 40], socio-technical systems theory [33, 37], social informatics [30, 31], and the technology enactment framework [16, 17].

2.1. Multi-agency state websites

Applications of Internet technologies in government are now more pervasive but only a few have been implemented as widely as government websites. In addition, government-wide websites are multi-organizational efforts and normally include a great variety of web applications from information display to transactional services and restricted networks. These multi-agency websites are particularly interesting because they require both operational and institutional change, and consequently they represent substantial difficulty in their design and implementation. At the lower end of the continuum, individual agency websites are initiatives that require low operational and institutional change. At the upper end, information integration among multiple government agencies can be achieved only by performing many changes in the operational processes and the institutional framework [6, 17].

Recently, the interest in studying websites and web portals at different levels of government has increased considerably [12, 14, 18, 44]. Multi-agency state websites can be considered key elements of successful e-government strategies. They are seen as comprehensive points of access to a great variety of electronic public services [18]. Websites have the potential to change the way citizens, businesses, and other stakeholders interact with government. They can help with the provision of services, improve communication, and promote citizens' engagement with government policies and programs. However, the promises and problems of information technologies for government reform have been widely recognized [21, 27, 32] and there is no reason to think that websites are different in this respect.

2.2. Enacting state websites: An enhanced theoretical model

By adopting an ensemble view of technology, this study investigates not only the enacted technology as the technical features and outcomes of the state websites, but also the processes that generate certain organizational characteristics and certain institutional arrangements [24]. Therefore, it is important to consider the more general context affecting the technology enactment process. In order to develop a more comprehensive understanding and capture different perspectives, the original technology enactment framework [16, 17] is complemented and enhanced with concepts and theoretical relationships from the process model of computing change, social constructivism, IT success literature, and environmental theories of organization (see Figure 1).

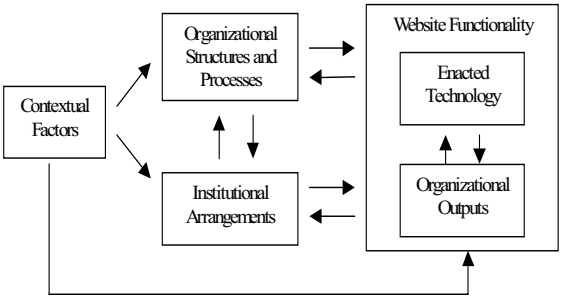

Figure 1. Theoretical Model (Gil-Garcia, 2005)

As mentioned earlier, this theoretical model is primarily based on Fountain's technology enactment framework and its basic logic is the same. Organizational structures and processes have an impact on the enacted technology and its outcomes. Institutional arrangements have an indirect influence on the enacted technology through their direct influence on organizational forms. Based on the process model of computing change and previous research on IT success, direct impacts from institutional arrangements and contextual factors are also taken into consideration. Finally, the recursive nature of the relationship between information technologies and social structures is acknowledged in most of the cases with arrows going in the opposite direction.

Some of the environmental dimensions [26] can be mapped to the technology enactment framework: technological conditions (objective technology); legal and cultural conditions (institutional arrangements). However, other important factors are not taken into consideration: political conditions, economic conditions, demographic conditions, and ecological conditions. This study expands the basic theoretical framework by including these important contextual factors. Thus, organizational, institutional, and contextual factors, as well as their multiple interactions affect the way information technology is selected, designed, implemented, and used [17, 31, 33, 35].

The "organizational structures and processes" construct includes both organizational forms [17] and management action [33]. This is consistent because "…computing management is a filter through which environmental opportunities and constraints must pass." [33: 105]. This does not imply that managers always know the exact effects of certain information technologies on the organization, but they have certain expectations [17, 33, 43]. Some of the possible expectations are cost reduction, organizational control, operational integration, and power reinforcement.

Figure 1 shows that functionality of state websites can be defined in terms of enacted technology (e.g., functional interface) and organizational outputs (e.g., efficient and effective services). In this case, enacted technology refers to certain characteristics of the website such as openness, usability, and accessibility, but also to the derived social relations and different uses. There is also a dynamic interaction between enacted technology, outputs, and organizational structures and processes. This recursive way of thinking about usability and other "technical" characteristics of information systems has been previously applied [11, 17, 33, 35].

3. Research design and methods

Methodologically, this study uses a mixed method approach called nested research design. Nested research encompasses statistical analysis and case study research [5]. First, a partial least squares (PLS) analysis was performed using available published information from all 50 states in the United States. Multiple organizational characteristics, institutional arrangements, and contextual factors were used as independent/dependent variables and the functionality of the state websites was the ultimate dependent variable. Table 1 shows the operationalization of all constructs in the PLS model.

Second, from the results of the statistical analysis two cases were selected based on their relative fitness to the model (residuals), the functionality of their websites (highly functional), relative improvement from 2000 to 2001, and comparability (similar managerial capabilities according to the Government Performance Project). Case studies were conducted for both selected states: New York and Indiana. These cases involved multiple data collection techniques such as semi-structured interviews and document analysis. The cases used a purposive sample of key

informants involved in the development and management of the state websites.

Table 1. Operationalization of the Constructs

Construct	Indicator
Electronic Government Success – State Website Functionality	Overall state e-government ranking (score)
	Digital state e-commerce score
	Number of e-commerce systems
	Number of online services
Organizational Structures and Processes – General Organizational Factors	Number of people working for the IT organization (Size)
	Percentage of the IT budget revenue sources from federal funds
	State provides accessibility training for IT professionals
	Percentage of the IT office budget devoted to maintenance
Organizational Structures and Processes – Web Management Practices	Website services are entirely outsourced
	Number of marketing media and intensity of marketing
	Only the IT organization directly provide website services
	IT organization directly manages portal development for agencies
Institutional Arrangements	State IT professionals are members of the civil service only
	State has executive orders/directives as the only way to establish authority for CIO offices
	State has an IT Specific Legislative Committee - Senate
	State has mandatory accessibility standards for state web sites
Contextual Factors – Political Orientation	Governor was democrat in 2000
	Governor was republican in 2000
	Percentage of votes for the democrat party in the previous gubernatorial election (1997 - 2000)
	Percentage of votes for the republican party in the previous gubernatorial election (1997 - 2000)
Contextual Factors – Demographic Factors	Median income per Family in 1999
	Median income per household in 1999)
	Percentage of population for whom poverty status is determined in 1999
	Percentage of households with Internet access in 2000
	Percent of Families below poverty level
	Percentage of population 25 years and over with bachelor's degree or higher education
	Percentage of households with computers in 2000
	Personal income per capita in 1999
	Percentage of households with Internet access in 1998
	Gross state product per capita
	Percentage of households with computers in 1998
	Percentage of population 25 to 34 years with Bachelor's degree or higher
	Percentage of population 25 years and over with high school or higher education
	Percentage of population 25 years and over with less than 9th grade education
Contextual Factors – Overall Size of the Economy	Local government private earnings
	Government and government enterprises private earnings
	State government private earnings
	Government gross state product
	Number of local government jobs
	Number of engineering and management services jobs
	State total revenue
	Number of government and government enterprises jobs
	Engineering and management services private earnings
	Number of state government jobs
	Number of jobs in the communications industry
	Communications industry private earnings
	Number of educational services jobs
	Number of electronic and other electric equipment jobs
	Electronic and other electric equipment private earnings
	Educational services private earnings
	Total state debt

Source: Gil-Garcia (2005)

4. Analysis and results

This section presents the analysis and results of the partial lest squares model and the two case studies. Most findings are highlighted in the discussion and implications section. This section only covers the basic PLS results and an introduction to the cases.

4.1. Partial Least Squares Analysis

Partial least squares (PLS) was used to empirically evaluate the recursive part of the theoretical model. PLS is a structural equation modeling (SEM) technique and can simultaneously test the measurement model (relationships between indicators and their corresponding constructs) and the structural model (relationships between constructs). It produces loadings between reflective constructs and their indicators, weights between formative constructs and their indicators, standardized regression coefficients between constructs, and coefficients of multiple determination (R-squared) for endogenous constructs (dependent variables).

In PLS, the relationship between a construct and its indicators can be modeled as either formative or reflective. In addition, PLS allows working with small sample sizes and makes less strict assumptions about the distribution of the data [25]. After a systematic assessment of all the conditions established by Falk and Miller [13], it was decided that PLS was the most appropriate technique for this study.

PLS does not directly provide significant tests. Significance levels for loadings, weights, and paths were calculated through bootstrapping. Two hundred bootstrap samples (200) were used to empirically calculate standard errors and evaluate statistical significance. PLS results are organized in two main sections. The first section presents the measurement model and assesses its validity (convergent and discriminant). The second section shows the results from the structural model and evaluates the relative importance of each independent variable.

4.1.1. Measurement model. Reflective and formative indicators must be treated differently. For reflective indicators, there are two important aspects of the measurement model that should be evaluated: convergent and discriminant validity [23]. Convergent validity can be assessed by the examination of indicator reliability, composite reliability, and average variance extracted [15]. All loadings, but one were above the 0.7 threshold, suggesting good indicator reliability. They are all statistically significant at the 1 percent level. Similarly, composite reliabilities (CR) were all greater than 0.7.

Looking at the square root of the average variance extracted (AVE) and the correlations among reflective constructs, all constructs were more strongly correlated with their own measures than with any other of the constructs, suggesting good convergent and discriminant validity. Finally, as suggested by Chin [4] cross-loadings were calculated and all

indicators showed higher loadings with their respective construct than with any other construct.

Formative indicators are not expected to be correlated with each other. Therefore, traditional measures of validity are not appropriate [4]. However, Bollen [1] mentions that validity is "the strength of the direct structural relation between a measure and a latent variable" (p. 222) and therefore, validity of formative constructs can be evaluated by looking at the size and significance of the their weights. These results can be examined to identify the relevance of these indicators for the research model in general and for each formative construct, in particular (all measurement model results available from author).

4.1.2. Structural model. The structural model represents the relationships between constructs that were hypothesized in the research model. In PLS there are not well-established overall fit measures. Paths (statistical and practical significance) and coefficients of determination (R-squares) together indicate how well the model performed. R-squares are measures of the variance in endogenous constructs accounted for by other constructs that were hypothesized to have an effect on them. Therefore, they can be interpreted as R-squares in regression analysis. Structural paths can be interpreted as standardized regression coefficients.

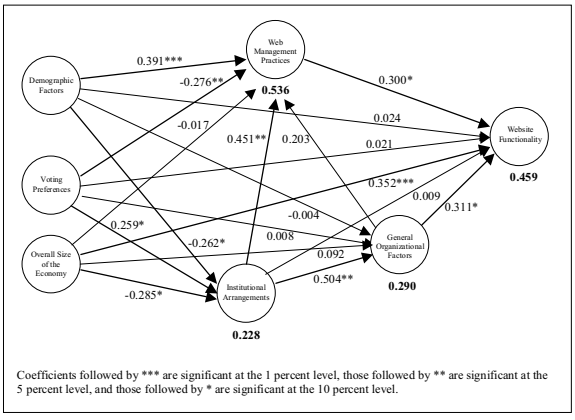

Figure 2. PLS structural model (Gil-Garcia, 2005)

General organizational factors have a significant direct influence on the functionality of the state website. Factors related to web management practices (represented by outsourcing, direct provision, marketing, and portal development) have a significant direct influence on the functionality of state websites. The overall size of the state economy is a significant direct factor in shaping the functionality of a state website. Some demographics representing the potential demand for e-government (such as education, income, computer ownership, and Internet access) were found to have an indirect effect on the functionality of the state website, through their significant direct effect on institutional arrangements and web management practices. Similarly, political orientation (conservative vs. liberal) has an indirect impact on the functionality of state websites through its significant direct impact on web management practices and institutional arrangements.

About 46% of the variance in state website functionality was accounted for by its explanatory constructs. Similarly, the model explained about 54% of the variance in web management practices, 29% of the variance in general organizational factors, and 23% of the variance in institutional arrangements. The average explanatory power of endogenous constructs in the model was about 38% (R-square = 0.3783).

4.2. Two highly functional state websites

From the results of the PLS analysis and taking into consideration the four criteria mentioned earlier, two states were selected as case studies. Most of the analysis and findings will be discussed later in this paper. This section only presents a very brief introduction to the cases.

4.2.1. New York State website. New York is a large and diverse state with a very young IT policy and management structure. It was the last major state to create a centralized IT agency (about 1997) following decades of almost complete decentralization of IT functions and services. Its current website structure and management reflects a hybrid of centralization and decentralization activities.

New York State started a systematic effort to integrate its website and present a more coherent image of state government on the web in 2000. At that time many NY state agencies had not only presence on the Internet, but were also offering a great variety of services. A centralized approach would have been very difficult to implement. OFT was relatively new and its main functions were not website development and maintenance. Agencies were already developing and managing the great majority of online information and services. Agencies had the technical capabilities and resources and OFT was not prepared to absorb all these responsibilities and workload. Leaders at OFT decided that a decentralized approach would be a much more feasible and efficient way to manage the state website, and it worked well for several years.

However, currently the New York State website is facing the challenge of more integration, at least virtually. According to some interviewees, the decentralized approach that helped New York to

accommodate organizational diversity and agency autonomy now needs rethinking. The New York State website has continued to slowly evolve through more integrated prototypes such as the small business portal. However, several leaders and managers at OFT think that the state website will need other changes very soon.

4.2.2. AccessIndiana. In contrast to New York, Indiana was one of the first states to build a state website. Its IT functions have strong legislative underpinnings and its central IT agency exercises a relatively high degree of authority over agency-based IT functions. In addition, Indiana's website, accessIndiana, is the product of a long-term public-private partnership.

Currently, Indiana Interactive, Inc. (a wholly owned subsidiary of the NIC, Inc.) is the manager of the state website and works with agencies in developing transactional services. Most online transactions are hosted at accessIndiana and managed in a centralized fashion. This model has been very successful and helped state agencies to develop new online services at a very low cost. In addition, accessIndiana has found ways to deal with state politics without getting too involved with or being responsive to only one of the branches.

Future challenges include the improvement of back-office processes. Leaders and managers of accessIndiana recognize that is relatively easy to create a good interface for a legacy system or a cumbersome back-office process. However, future improvements have to deal with bureaucratic work processes that are not always linked or efficient. This type of change is necessary in order to have a more integrated website and get the benefits from e-government.

5. Discussion and implications

This study starts developing and testing a theoretical model that was based on Fountain's Technology Enactment framework and enriched through a review of IT and organizations literature. Two case studies are used to enrich the initial understanding and provide preliminary explanations. Therefore, the overall findings integrate insights from both statistical analysis and the case studies. This section includes the relevance of different variables, but also explore some of the possible causal mechanisms that took place in each case.

Table 2 presents and compares the main findings from the statistical analysis and the two case studies. Even though both cases are considered successful by external measures, their histories and institutional environments were very different. Indiana started about 5 years earlier than New York and adopted a relatively centralized approach to online services. By contrast, when New York started its integrated e-government initiative, many of the State's agencies were already providing a variety of information and services. Therefore, a decentralized approach was more useful and feasible.

Table 2. Relative Importance of Influences on Website Functionality

Original Influences	PLS	New York	IN
Total Number of Employees at the Central IT Organization	***		
Specialized Training for State IT Employees (i.e., accessibility)	**	**	*
Civil Service influence on State IT jobs	***	*	
In-house responsibilities for the State Web site	**	**	**
Outsourced responsibilities for the State Web site	***	*	**
Size of the budget for Web site maintenance		**	*
Other agencies' reliance on the central IT organization for Web development			
Executive Orders creating and supporting the State CIO	***	**	***
Marketing of the Web site	***	***	***
Citizen expectations for Web services	(*)	***	***
Total size of the State's economy	(*)	**	
Availability of Federal resources	**		
Legislative involvement in Web site definition and management	*		**

Note: For the PLS column *** means the loading or weight for this indicator was statistically significant at the 1 percent level, ** means it was significant at the 5 percent level, * means it was significant at the 10 percent level, and (*) means that the influence actually represents a construct. For the New York and Indiana columns *** means that at least 75% of the respondents in each case study rated the influence as important, ** means at least 50% of respondents did, and * means at least 25% of the respondents did. Source: Adapted from Gil-Garcia (2005).

5.1. Cases Background

The New York State website as a whole is a combination of in-house development and outsourcing. However, the portal was developed and managed by the Office for Technology and most web pages are developed and maintained by individual agencies. Therefore, maintenance and improvement of the website is closely related to the state budget. In contrast, accessIndiana is a public-private partnership in which a private company, Indiana Interactive, manages the portal and most of the transactions offered through the website. Its maintenance and improvement are not tightly linked to the state budget, but to website usage and the revenues it generates through fees.

AccessIndiana and its governance structure are supported by legislation. From the very beginning, the website effort had a clear but flexible legal

framework. For instance, agencies were required to participate in the website and meet certain requirements. In New York, most of the integration effort came from a Governor's initiative and few things in relation to the website are in New York code. Most of the guidelines and standards are policies developed by executive agencies.

5.2. Important Influences

Overall, web management practices, general organizational factors, and availability of resources for state agencies were factors that had a direct effect on the functionality of state websites. As presented early in this paper, some of the indicators for the first two constructs were size of the IT organization, budget allocation, IT training, in-house development, outsourcing, and marketing strategy. Availability of resources is represented by the overall size of the state economy. Brief discussions of each indicator and its importance are presented next.

5.2.1. Number of IT employees. The size of the IT organization was considered important because some small agencies rely on the centralized IT organization for applications development and website management. However, respondents agreed that the absolute number of employees in the IT organization is not as important as having human resources dedicated to the website and adequate to the demands of the web strategy.

There are some important differences in how this influences the success of the New York and Indiana websites. The number of employees in the centralized IT organization and having adequate human resources seemed to be more important for a state like New York that directly manage their portals. In a state that has outsourced the management of their web portal, such as Indiana, many of the necessary staff works for the outsourcing company, which has more flexibility in hiring, assignments, and compensation.

5.2.2. Budget allocation. The budget for website maintenance was identified as important. This budget is directly related to the ability to keep things up-to-date. Some respondents emphasized that the way in which financial resources are managed is much more important than how much money is available. However, they also recognized that there is a clear relationship between the size of the budget and how many things an agency can do.

5.2.3. Specialized training. Specialized training for state IT employees is closely related to website design and development, which require certain skills that are not always readily available in a state's IT workforce. In addition to supporting better design and programming, training can also help to communicate other organizational messages regarding standards, the business model in place, and overall strategies, among others.

Specialized training was recognized as an important factor in both cases. However, the specific skills deemed important varied in different contexts. For example, in Indiana, Indiana Interactive is responsible for most of the development of web applications related to fee-based transactional services. In order to meet specific deadlines, however some agencies decide to outsource the development to other private companies. For these agencies, contracting and negotiating skills are important. Others may develop the application themselves. For these, certain technical skills are needed.

5.2.4. In-house development and outsourcing. In-house and outsourced responsibilities for the state website are also important. First, agencies are clearly able to shape the characteristics of their own websites. Their commitment to the website is reflected in the quality and currency of the information and services provided. Second, IT initiatives in general and website management in particular often involve outsourcing. In these situations the contractual requirements and the technical and organizational capabilities of vendors will have an impact on the quality of the state website.

In New York, some outsourced responsibilities are used by several individual agency websites, including the Governor's Office. The management of the portal is an in-house responsibility at OFT, but coordination among state agencies and vendors is still important. In Indiana, Indiana Interactive manages the portal and most transactional services. Even in Indiana's mostly outsourced environment, respondents said that in-house responsibilities are extremely important. Support and commitment from state partners are two important elements for a public-private partnership model to work well. For instance, strategic and operational staff from the Office of the CIO and Indiana Interactive have regular meetings to discuss progress and future direction.

5.2.5. Marketing strategy. The marketing of the website was one of the most frequently mentioned factors associated with web site success and had a highly significant relationship in the PLS analysis. Marketing efforts can help to identify information and services that users really want, as well as some of the characteristics that they would like the applications to have.

New York does not market its website very much. In contrast, Indiana's convenience-fees approach needs aggressive marketing and it is extremely important. Marketing efforts lead to more usage of the website, and more usage leads to more resources to continue developing accessIndiana. Marketing is therefore a key element of accessIndiana's overall strategy. In fact, one of the four main areas in the organizational structure of Indiana Interactive is marketing.

5.2.6. Availability of resources. The availability of resources for state agencies is represented by the overall size of the state economy and it seems to be another important success factor. One possible explanation for this situation is the fact that many large agencies develop their own websites from program budgets. In general terms, the overall size of the economy is closely related to the state budget. For traditional bureaucratic organizations, the state budget is almost the only source of revenue and therefore, it is closely related to their capabilities to develop programs and projects, including web development and maintenance.

For instance, in New York, the overall size of the state economy was identified as closely related to the size of the state budget and was therefore an important influence on website development and management. The state budget not only impacts OFT, but also all other state agencies. In contrast, for Indiana the overall size of the economy was identified as closely related to the size of the population and therefore the size of the potential market for e-government services. For Indiana Interactive, as for any private company, the size of the market is important to assess the feasibility of certain services.

6. Concluding Remarks

E-government is a social phenomenon whose importance has been rapidly increasing in recent years. The case of government-wide websites is especially interesting due to its multi-organizational nature at the virtual level, but its single-organization nature at the physical level. Government-wide websites also represent an interesting potential mixture of all possible applications of Internet technologies, from restricted intranets and extranets for specific audiences to open websites that offer information and services to the general public.

Taking into account all the complexity of this phenomenon, this study provides knowledge about e-government success in multi-organizational settings. General organizational factors, web management practices, and availability of resources were found to be statistically significant factors of state website functionality. However, it seems clear that there is no one path to e-government success. The two case studies included in this research had very different histories, managerial approaches, and division of labor among actors. They were embedded in different institutional frameworks, and were influenced by different economic, social, and political factors. However, both states managed to develop functional websites that provide good information and a great variety of electronic services.

In addition, this study uncovered several parallel stories, in which actors from the two case studies mentioned the same factors as important but for different reasons. It is also important to clarify that some factors are important by themselves, but the way people think about them and use them strategically may be even more important than the presence of the factor in a specific situation. Theoretically, it seems clear that environmental forces and organizational structures are important, but managerial action and strategies are also determinants of e-government success.

E-government success is a theoretical and practical concern. Theoretically, there are few comprehensive efforts to understand information technologies in government settings. This study integrates insights from the technology enactment framework, the process model of computing change, and environmental approaches to organizational theory to generate necessary knowledge about e-government success. Comprehensive research has the potential to capture more accurately the real complexity of social phenomena and, therefore, can provide a better explanation of complex situations. Comprehensive approaches also have the opportunity to integrate elements of previous theories that look at specific sub-components of the social phenomenon of interest. Thus, they can be used to present a picture of the potential intersections and complementarities of different approaches to the same phenomenon.

Practically, public managers at all levels of government are attempting to increase their probabilities of success in e-government initiatives in general and e-government websites in particular. This study clearly shows the complexities and challenges of e-government. Public managers and other decision-makers can influence some of the factors analyzed in this research. They can increase their success rates by modifying some organizational structures and processes, or even by engaging other stakeholders in institutional changes. In order to increase e-government success, public managers can be important actors in promoting this necessary government reform. In contrast, other factors are

enduring characteristics of the governments and their jurisdictions. Public managers should be aware of these factors and adjust their expectations and strategies accordingly. Understanding the complexity of e-government can help to set more realistic goals and develop better e-government strategies.

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