Internet Use and E-Government Performance: A Conceptual Model

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Abstract

Internet has become the favorable topic for numerous studies in the recent years. This research develops a conceptual model linking the use of Internet with e-government performance. The model identifies two organization factors that mediate the links between the use of Internet and e-government performance: organizational structure change and business process change. In this article, we focus on the role of Internet as drivers and identify organization changes that are affected by the use intensity of Internet as mediators and e-government performance as outcomes. In addition, transformational leadership and strategic plan are chosen as control variables in our model. The proposed model hypothesizes relationships for empirical testing and theory building in the future.

Keywords: Use intensity of Internet, Organizational change, Strategic plan, Transformational leadership, E-government performance

1. Introduction

E-government has been one of the fast growing areas of information technology in recent years. Internet is an invaluable tool in nearly every organization (Shi, Y. B. 1996). Thus, it is crucial to discover how to improve the government performance through Internet use. The positive impact of Internet on industrial organizations has been addressed in many studies (Cronin, Mary J. 1994; Mehta, Raj and Sivadas 1995; Stump, R., and Sriram, V. 1997). However, the differences between firms and governments require a specific attention paid to the e-government. Therefore, this work is focused on the relationships between the use of Internet and e-government performance. In the context of e-government, Internet’s core advantage lies in not only its great potential of efficient exchange of information within the governments but also its great capability of effective interaction and transaction between governments, citizens and enterprises.

This paper develops a conceptual model for the role of Internet use as drivers, organization change as mediators and government performance as outcomes. Consistent with previous research, we controlled for transformational leadership and strategic plan as control variables to account for any difference in e-government performance. This inquiry has both theoretical and practical implications. It aims to enhance the understanding of the role of Internet in government organizations. Internet holds significant potential for government to improve the external quality of public service and internal operational efficiency. However, there is little empirical testing of how Internet may play a role in enhancing the government performance.

The remainder of the paper is structured as follows. Section 2 provides a description of the conceptual framework. Section 3 describes the constructs and control variables in the
conceptual framework and research hypotheses are proposed in section 4. Section 5 contains concluding remarks.

2. Conceptual Model
The conceptual model of this study is drawn from three streams of research: IT and Internet value literature, organization change theory and e-government performance measurement theory. Figure 1 shows the conceptual model. These linkages deal with two sets of hypotheses: the relationships between the use of Internet and organization change as well as the relationships between organization change and e-government performance.

3. Key Constructs

3.1 Use Intensity of Internet
Internet is not only an important information technology but also an indispensable communication and management tool in e-government. How to examine the use intensity of Internet is a critical problem for investigating the relationships between Internet use and e-government performance. Among Internet values literatures George J. Avlonitis’s study on the use intensity of Internet is representative. He uses two variables, use of the Internet tools and the Internet budget, as indicators of the use intensity of Internet.

E-government program is a long-term systematic engineering and requires large expenses including purchase and maintenance of computer and network equipment, trainings of employees, change management and coordination cost and so on. Thus, the Internet investment, especially capital, often become a barrier to achieve e-government success. What’s more, e-mail, File Transfer Protocol (FTP), and the World-Wide-Web (WWW) are the most popular tools in numerous government internal activities such as file management, meeting management and human resources management as well as the communications between government employees and citizens or enterprises. Therefore, as in George J. Avlonitis’s study, we also use the use of Internet tools and the Internet budget as indicators of the use intensity of Internet.

3.2 Organization Change
Organization change is defined as the extent of changes made in an organization in terms of improving the business practices and process. And it involves making changes to business practices and improving the business process, ultimately making the organization function more efficiently(Sungmin Kang, B.S.2001). There are numerous literatures examining the impact of information technology introduction on the organizations. Hammer and Champy (1993) considered IT as the key enabler of BPR. O’HARA(1999) stated that all new
information technologies bring changes in organizations and the degree of change varies depending on the capability of technology introduced and goals for the technology use. E-government requires the introduction and use of information and communication technology which influences the organizational structure and work process (Mehrzad (Matt) Poostchi, B.C.S., B.COMM. (Hon.) 2002). Internet usages are necessary but not sufficient antecedents of E-government performance. It must be going with the organizational change in order to achieve e-government success. In the context of e-government, organization changes are made by organizational structure change and business process change.

We operate the constructs, organizational structure change and business process change, by referencing the work of several researchers where relevant such as Sungmin Kamg and Mehrzad Poostchi’s studies. We will examine the construct, organizational structure change, by the following items: (1) we had to make many changes to our organizational structure in order to conduct e-government; (2) our organizational structure are changing flatter; (3) new changes are implemented often in the organizational structure along with the development of e-government. In the similar way, business process change can be operated as the following items: (1) most of the business processes enabling e-government are automated; (2) most of the business processes enabling e-government are reengineered; (3) most of the business processes enabling e-government are transformed.

3.3 E-government Performance
Measuring the performance of e-government is an inextricable component of e-government applications. And e-government performance measurement has become a favorable theme for numerous studies and practices (Joan C. Steyaert 2004; Stuart J. Barnes, Richard Vidgen 2004; M. P. Gupta, Debashish Jana 2003). There is no uniform definition about e-government performance. In our study, e-government performance refers to the impact of e-government applications. Some researchers have identified the impact of e-government implementation. Alina M. Chircu (2004) states that e-government value includes economic value (a quantitative measure of cost, time or labor savings, and productivity improvements), social value (the effectiveness of delivering high-quality services to citizens and other constituents, creating public goods and allocating government resources to those who need them most) and political value (enablement of social justice, liberty, democracy, transparency, and accountability). In the same vain, Marcella Corsi and Elio Gullo reinforce the idea that three different kind of assessment to be made to measure the performance of e-government: service level to constituents (e.g., is the service what they need? Are they using it? Does it provide greater value at the lower cost then offline service?), operational efficiency (e.g., are on-line transactions reducing government costs?) and macroeconomic return (e.g., is E-Government increasing consensus? Are there any positive effects on the economy and the society at large?).

In our studies, e-government performance as dependent variable includes service level to constituents and operational efficiency. And we refer to Wenbo Shi’s ‘perceived benefits’ to operate the constructs. We will use four items to represent service level to constituents: (1) improve quality of output in the service delivery; (2) increase client satisfaction; (3) provide another means to access the information collected, generated and disseminated by the government; (4) improve communication with citizens about public issues. We operate the construct, operational efficiency, as the following three items: (1) reduce overall cost for the agency (2) be cheaper than the cost of doing business the traditional way (3) increase job satisfaction
3.4 Control Variables
As illustrated in Figure 1, we identify transformational leadership and strategic plan as control variables in our models.

Transformational leadership is defined as the process of influencing major changes in the attitudes and assumptions of organization members and building commitment for major changes in the organization’s objectives and strategies (Yukl, G.1989; Yukl, G.,& Van Fleet, D.D.1990). Daft, Richard (1994) emphasized it as an important factor for the successful implementation of any business process innovation. Rosenbloom (2000) provides a rich description of the importance of leadership at NCR in its organizational transformation. Therefore, we anticipate that transformational leadership will be an important factor on the development of organizational change.

Strategic planning refers to the strategy making process, including analysis of customer needs, competition, technology, and strengths, weaknesses, and risks (Hamel et al. 1995; Porter1996; Porter 2001). In our study, strategic planning refers to the analysis of e-government’s costs, benefits and risks so as to prepare the government organizations to deal with all kinds of uncertainties. Therefore, we expect strategic planning to be an important control variable.

4. Hypothesis
Drawing upon the constructs reviewed before, we develop hypotheses linking Internet use with e-government performance through the mediating roles of the two organizational factors.

4.1 Relationships between Internet Use and Organizational Change
Numerous researches identify the link between the adoption of information technology and organization changes. Hammer and Champy(1993) stated that the introduction of information technology in an organization has a profound effect on organization structure, work processes and employees. Westland and Clark(1999) stated that organization hierarchy is reduced and firms is downsized by computer and communication networks because of the speed and volume of information that can be automatically processed and passed around firm. OECD’s(2000b) indicate that organization change is required typically when a firm use information and communication technology. In the E-government context, the introduction and use of numerous information and communication technologies would modify government organizational business processes and organization structures to better serve citizens, businesses and partners(Mehrzad(Matt) Poostchi,B.C.S., B.COMM.(Hon.) 2002).

Drawing on the literature on the impact of IT on organizational change, it is elicited that the Internet use will promote organizational change to become flatter in the e-government context.

Generally, more Internet budget in government results in more network infrastructures and capabilities, which will facilitate organizational communication and coordination. On one hand, some departments will be cancelled because of good communication and coordination provided by sophisticated network infrastructures installation. On the other hand, the introduction of network infrastructures will lead to three type of business process change such as automation, reengineering and transformation. Automation is defined as replacing a manual process with an electronic process. Reengineering is defined as increasing the efficiency of a process, such as reducing the number of steps in a particular process. Transformation requires the complete reinvention of a process. (Mehrzad(Matt)
Poostchi, B.C.S., B.COMM.(Hon.) 2002) Automation is the first phase for government’s informationization and requires least money in contrast to transformation. And transformation is the best outcome along with the greatest Internet budget.

Thus, different Internet budget will bring about different degree of organizational structure change and business process change in the governments. Therefore, we hypothesized that

H1: The amount of Internet budget is positively related to the flattering degree of government organizational structure change.

H2: The amount of Internet budget is positively related to the automation (reengineering, transformation) degree of government business process change.

The use of Internet tools will play an important role in organization change. For example, E-mail will be an ideal tool for government employees to interact with leaders directly. And the FTP facilitates the file or data upload and all kinds of forms download within the government and publish information with efficiency outside the government. Certainly, all of these will downsize employees and make organizational structure more flatter and business process more transformed. Thus, we hypothesize the following:

H3: The extent of the Internet tools use is positively related to the flattering degree of government organizational structure change.

H4: The extent of the Internet tools use is positively related to the automation (reengineering, transformation) degree of government business process change.

Wenbo Shi (2001) found that transformational leaderships and strategic planning have important influence on the success of e-government applications. Organizational change needs to examine all aspects of government’s current business processes and top management’s support and leaderships will promote the transformation of the attitudes and assumptions of organization members. Certainly, setting organization change’s objectives and strategies are responsibilities for top managements. At the same time, organizational change has costs, benefits and risks, so strategic planning will be helpful to prepare the government organizations to deal with all kinds of uncertainties. As transformational leaderships and strategic planning seems to play a role in the usage and effectiveness of Internet, the following hypothesizes are proposed:

H5: the effect of Internet use on organizational change varies according to transformational leaderships.

H6: the effect of Internet use on organizational change varies according to strategic planning.

4.2 Relationships between Organizational Change and E-government Performance
Organization changes have been noted in prior research as having a significant impact on firm performance (Teng, James, V. Grover, K.D. 1994; J. Champy, A.2002). In the context of e-government, the flatter organizational structure will make information publish more timely and the time citizens or enterprises spend interacting with governments will be shortened. At the same time, providing a service through an electronic channel can reduce the costs of citizens or enterprises. In the same way, within the government, the flatter organizational structure not only reduces the operational costs and saves time but also make
decision-making more quickly. Thus, it is hypothesized that

H7: The flatter of organizational structure the higher of government service level to constituents.

H8: The flatter of organizational structure the higher of the government internal operation efficiency.

Government process reengineering has been a popular research field for many researchers. In the same vein, business process’s automation, reengineering or transformed will shorten the time of citizens and enterprises transacting with governments and make government processes(such as human recruitment) more transparent for citizens and enterprises. Certainly, it will ease employees’ burden and enhance work efficiency. Therefore, we propose that:

H9: The more automated (or reengineered, transformed) of the government business process the higher of the government service level.

H10: The more automated (or reengineered, transformed) of the government business process the higher of the government internal operation efficiency.

5. Conclusions
The model is the first step in conducting investigations into the possible links between the use of Internet and the performance of government. Our theoretical arguments proposed that rather than directly impacting e-government performance, the use of Internet enable significant organizational changes that, in turn, impact e-government performance.

This paper contributes to the academic literature of e-government performance improvement. The conceptual model provides clarity for design of future empirical studies focused on e-government impacts. For practice, the research provides useful guidelines for public sector managers for improving and justifying e-government projects.

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