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Study on the Conceptual Model of E-Government standards Adoption

Based on Institutional Theory

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Abstract: The purpose of this study is to investigate the forces that promote national e-government standards adoption and diffusion by government agencies. By using institutional theory as a theoretical basis, a conceptual model is set up and the hypotheses are proposed. Three forces of improving national e-government standards adoption are discussed. They are coercive forces, mimetic forces and normative forces. The survey questionnaire has been developed which will be used to test the theoretical model. All the data will be expectedly collected by the end of May, 2013 and then the structural equation model will be analyzed with PLS. From a theoretical perspective, the research model may be informative for researchers investigating the adoption of other technological standards. From the practical perspective, the research results may give some advice to government officials to promote the diffusion national e-government standards.

Keywords: e-government, national standards, adoption, institutional theory

1. INTRODUCTION

In recent years, government agencies all over the world have been made great effort to improve the service efficiency to citizens and business enterprises as well as increase their decision-making and supervision performance. E-government was just thought as a means of promoting the internal administrative efficiency for single government agency about ten year ago. However, nowadays, e-government is regarded as an effective pattern for promoting the collaboration among government agencies. In China, like other countries, e-government has been developing rapidly in recent ten years. At the beginning, each government agency set up single system and website according to different standards and rules which has seriously hindered the interoperability among government agencies and formed lots of information isolations.

To solve these problems, in 2002, central government set up "National e-government standardalization General Team" which is responsible for developing national e-government standards. Many national e-government standards have been set up during recent ten years. However, according to our field study, many standards have not been applied successfully for various reasons. Some national standards can't be recognized by local agencies and practical e-government projects lack the motivation of implementing national standard which lead to build many redundant projects nationwide. For examples, the project of Four-Basic Databases, in many cities, have been set up in form while have not been actually applied into service.

Aimed this situation, the paper tries to explore what factors influence the adoption and diffusion of national e-government standards. To answer the research question, we take the perspective of institutional theory, which helps to explain how an innovation is maintained, reproduced and diffused. While there have been many studies about e-government success factors, there has been little research about by which an e-government standards is developed, enforced, and diffused. This paper contributes to the theory and practice of e-government by highlighting how an e-government is adopted, diffused, and institutionalized.

The paper is organized as follows. Section 2 reviews studies of e-government standard, focusing on

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standards making and adoption, and introduces the institutional perspective. Section 3 sets up the conceptual model of e-government standard adoption. Section 4 outlines the methodology will be used. Section 5 presents this paper's future study and conclusions.

2. LITERATURE REVIEW

2.1 E-government standards

E-government standards set up a set of rules and policies that information systems of government agencies must comply with to become interoperable and unified [1]. National e-government standard frameworks contain a set of policies, guidelines and legal process related to information sharing and interoperability of information systems among different government agencies.

Standards are not just concerned with the transfer of bits and bytes, but a way to solve the complicated business matters of getting government agencies to share information and interoperation [2]. E-government standards are shifting from a purely technical view to a wider approach concerned with organizational, business processes and informational issues. There are three types of standards [1], namely:

(1)Business process standards. Business processes standards mainly refer to stating business goals and modeling business processes. Organization standards will ensure the business process for exchanging information and collaboration among different agencies which may have different internal structures and processes.

(2)Semantic standards. Semantic standards are mainly concerned with defining what information formats are, what the information meaning is, and what information should be or not be shared an application.

(3)Technical standards. Technical standards refer to the technical issues of linking up information systems, e-government databases and e-government websites for interoperability.

2.2 Institutional theory

While there have been many studies that identified success factors of e-government project from various viewpoints, few studies have been conducted on the process of how an e-government standard is developed, adopted, and diffused. To address this relatively unexplored aspect of e-government, we use institutional theory because we view e-government standards as institutions that are "multifaceted, durable social structures, made up of symbolic elements, social activities and material resources" [3]. Institutionalization is the process by which the standards are made, adopted, diffused and reproduced [4].

DiMaggio and Powell's (1983) analysis of institutional isomorphism proposes three key forces—coercive, mimetic and normative isomorphism. A coercive mechanism comes from the political rights and related law influence [5]. An organization may be affected by political rights and legislation to make decisions to adopt a specific new policy or innovation [4]. Mimetic forces refer that an organization imitates other organizations that have been successful in certain aspects (e.g. adopt an innovation) in the same industry [6]. A normative mechanism is motivated by norms that are prevalent and observed in the domain to which the organizations belong [4]. Normative forces emanate from other members of a network, defining and sharing the norms of the organization [6].

Recent research on IT innovation adoption has used institutional theory to explain EDI adoption [7], VoIP adoption [8], electronic marketplace adoption [9], electronic resource package adoption [10], e-procurement systems adoption[11], and XBRL adoption[6].

3. CONCEPTUAL MODEL AND HYPHETHESE

3.1 Coercive forces

Coercive forces refer to the forces brought to organizations by the higher administrative organizations upon

which they are dependent [5]. Due to coercive forces, the subordinate organizations may be required to follow the similar adoption patterns as those organizations depend on the same upper administrative agencies [7]. In the context of e-government standards, coercive forces primarily stem from 3 sources.

The first source is government mandate or executive order. One agency can exert pressure on another by controlling resource allocations or by legal powers. For example, chemical companies are required by government agencies to apply certain pollution control technologies [5]. The company must abide by the regulation, if not, they may be faced with economic sanctions or be required stop manufacture.. Different government agencies have established various initiatives, directives and legislation that require certain agencies to implement e-government standards or follow e-government framework. For example, the Association of Southeast Asian Nations (ASEAN) attempted to persuade its member countries to implement union e-government strategies; however, the ASEAN member state all responded differently to the initiative, perhaps because the organization does not exercise strong authority over its member states, no do members depend on ASEAN for resources[12].

The second source is treasure's directive. Nearly all of the nation's government agencies depend on the government treasury for financial and other resources, and to the extent that the treasury requires agencies to use e-government in their budgeting or appropriate special funds for e-government systems, the national treasury may play a dominant role. Other possible sources of coercive forces inside government include an agency's parent ministry and the nation's executive agencies (i.e., the Sate Council).

The third source is cooperative partners. Government agencies may want other agencies to adopt e-government standards in order to increase efficiency during the process of interoperability. For example, a government agency may require another agency to receive information in certain standards, thereby reducing any re-keying of data and increasing efficiency. Hence, agencies may require their cooperative partners set up and adopt the same e-government standards in order to integrate inter-organizational systems. Government agencies can respond to this force by adopting the same standard because non-adoption can negatively impact their cooperative partnership. Prior research has found strong support for the influence of coercive forces on the adoption of other technological standards [5,7, 13,14] .

Thus, we propose the following hypotheses:

H1a: coercive forces from government mandate or executive order will have a significant positive influence on government agencies adopting national e-government standards.

H1b: coercive forces from treasure's directive will have a significant positive influence on government agencies adopting national e-government standards.

H1c: coercive forces from cooperative partners will have a significant positive influence on government agencies adopting national e-government standards.

3.2 Mimetic forces

Mimetic forces source from the exemplary effect by other organizations in the same industry. [5]. Prior research has found the influence of mimetic forces on the adoption of other technological standards, such as EDI, XBRL. For business organization, the mimetic forces often because of the competitive pressure from the leading enterprises. Reflecting a bandwagon effect, organizations follow best practices adopted by other organizations [9]. If many organizations in the same industry adopt an innovation, others in the industry will also adopt in order to avoid the risk of being perceived as less innovation. In the context of e-government standards, these arguments suggest an agency may adopt national e-government standards because other agencies also adopted. There are two mimetic sources including domestic government agencies and government agencies in other countries.

The most frequent source is from domestic government agencies. When a government agency might not have a clear plan or knowledge about certain e-government system or e-government program, on most occasions,

they implement the e-government system or project by imitating other agencies with which they share a common environment and goals. According to Rogers [15], the assimilation of an innovation requires adequate knowledge and skills within the organization. Lack of knowledge may increase the failure risks about certain e-government project and direct imitating may largely avoid the risks. Some agencies may also imitate others in order to avoid the humiliation of being classified as laggards in adopting new innovation [16] (Goodstein, 1994).

Both mimetic and coercive forces may exerted by the same sources. However, coercive forces are usually imposed by an upper-level agency, and when the subordinate agencies feel forced to follow certain standards with the conditions of financial or other resources. Forces are mimetic when upper agencies encourage imitation for the successful application of certain e-government pattern by some agencies, rather than for resource conditions. In these cases, the imitating agencies are rational action, that is, they are able to evaluate choices of action.

Thus, we propose the following hypotheses:

H2a: mimetic forces from domestic government agencies will have a significant positive influence on government agencies adopting national e-government standards.

H2b: coercive forces from government agencies of other countries will have a significant positive influence on government agencies adopting national e-government standards.

3.3 Normative forces

Normative forces exerted forces through the continuous interaction of external environment and internal motives or interests of an agency[12].Prior research has found that normative forces can have a significant positive influence on the adoption of inter-organizational information systems such as B2B marketplaces[9]，EDI[7] and XBRL[6]. It is found that normative forces were more significant than coercive and mimetic forces during the adoption process of financial EDI among business organizations [7]. In the context of e-government standards, there are three sources of normative forces coming from.

The first source is cooperative project. The project imposes great normative forces within all the project members. Members of the same e-government project will form formal or informal communication networks that will influence the decision-making process concerned the project. That is to say, these partners form and share common business rules and business values that becomes internal standards within the projects.

The second source is professional associations and committees. Professional associations and committees constitute a source of normative forces [5] as they can disseminate normative rules about organizational behavior and can significantly influence organizational behavior with respect to IT adoption[17]. In the context of e-government standards, important professional associations that have encourage the uses of e-government standards include National Information Center，China Information Association & E-government Expert committee，E-government Association，etc. These associations and committees can foster a greater understanding of the benefits associated with e-government standards, thereby potentially increasing its adoption.

In addition to professional association, an agency's relationships with other organizations like consultants and product vendors can also influence e-government standards adoption. An important relationship for an organization in the context of e-government standards is its relationship with its e-government consultants and product vendors. E-government consultants and product vendors/developer educate and encourage their clients to improve e-government in many areas, including e-government service level for citizens and business, supervision level, decision level. This pertains to national e-government standards as it can increase the interoperability among government agencies.

Thus, we propose the following hypotheses:

H3a: coercive forces from cooperative project will have a significant positive influence on government

agencies adopting national e-government standards.

H3b: coercive forces from professional association will have a significant positive influence on government agencies adopting national e-government standards.

H3b: coercive forces from e-government consultants and product vendors will have a significant positive influence on government agencies adopting national e-government standards.

Therefore, the conceptual model is set up as figure 1.
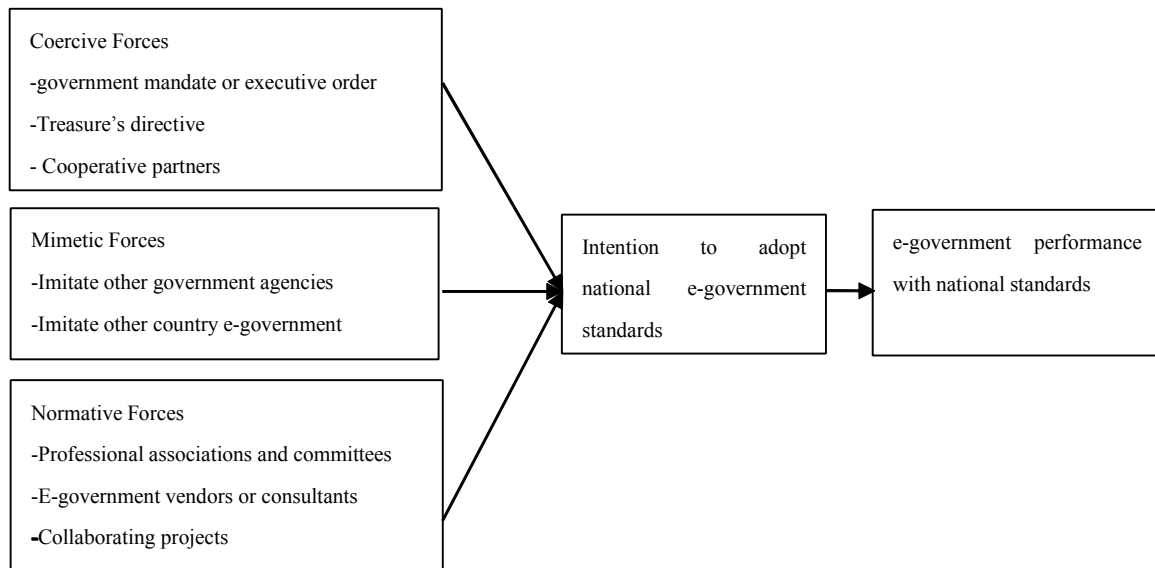
Figure 1 Conceptual Model of National E-government Standards

4. RESEARCH METHODOLOGY

4.1 Survey development procedures

A three-phrase approach was conducted to develop the survey instrument. The first phrase, construct definition, involved developing valid definitions for each construct by conducting a thorough literature review. Phase two, an initial item development phase, involved creating a baseline pool of items for each construct.

After development of the initial items, four e-government information systems professors, 3 e-government officials in government agencies, 2 e-government consultants and e-government developing company leaders, who are familiar with national e-government standards, pre-tested the survey. Each expert evaluated the survey for clarity and quality of instruction, clarity and quality of the items, time to complete the survey, and general flow of the survey. According to experts' advice, the survey was revised, such as clarifying the constructions and the wording of certain items.

4.2 Samples

Although national e-government standards have an organizational locus of adoption, perceptions of senior and mid-level officials responsible for e-government strongly influence how organizational policies are enacted. Thus, the national e-government standards adoption decision is influenced by the perceptions of individual executive in the organization. Respondent are from several sources. First, senior and mid-level officials who are responsible for e-government within government agencies; second, officials from central government agencies or associations who are responsible for organization forming and making the e-government standards; third, consultants from companies who are experts in e-government. Data are collecting from Oct. 2012 until now. It is estimated to be finished around May 2013.

Table1   Questionnaire Instrument development

Variables	Definition	Items	Theoretical basis
e-government performance with national standards	With the national standards in all the government agencies, the quality of e-government service and supervision of the e-government interoperability framework.	EP1: Applying national e-government standards around all government agencies will improve the efficiency of e-government interoperability framework. EP2: Applying national e-government standards around all government agencies will improve the effectiveness of e-government interoperability framework. EP3: Applying national e-government standards around all government agencies will improve the transparency of e-government interoperability framework. EP3: Applying national e-government standards around all government agencies will improve the accountability of e-government interoperability framework.	Tsai et al.(2012); Colesca&Dobrica(2008)
Intention to adopt National e-government standards	The willingness of government agencies to adopt the national e-government standards.	IA1: our organization have a positive attitude towards adopt e-government standards. IA2: It is beneficial to implement national e-government standards.	Colesca&Dobrica(2008)
Coercive forces	The degree to which the government agencies feel pressure from laws, government mandate or executive order, treasure's directive and partnership agencies to adopt standards.	CF1: Our organization is forced by laws to adopt national e-government standards. CF2: Our organization is forced by government mandate and executive order to adopt national e-government standards. CF3: Our organization is forced by treasure's directive to adopt national e-government standards. CF4: Our organization is forced by partnership agencies to adopt national e-government standards.	Kayya(2006); Henderson et al.(2012)
Mimetic forces	The degree to which the government agencies feel pressure from other government agencies in China and in other countries and adopt standards.	MF1: Our organization will use national e-government standards to remain consistency with other agencies in China. MF2: Our organization will use national e-government standards learning from government agencies in other countries. MF3: Approximately what percentage of the organizations around your organizations adopts national e-government standards?	Kayya(2006); Henderson et al.(2012)
Normative forces	The degree to which the government agencies feel pressure from professional associations and committees, e-government consultants and product vendors.	NF1: The collaborating project requires us to adopt national e-government standards. NF2: Our external e-government consultants and product vendors pressure us to adopt national e-government standards. NF3: Third parties, professional associations and committees pressure us to adopt national e-government standards.	Kayya(2006); Henderson et al.(2012)

5. CONCLUSIONS

The purpose of this study is to investigate the forces that promote the national e-government standards diffusion. By using the institutional theory as a theoretical basis, a conceptual model is set up. Three forces to the adoption of the national e-government standards are discussed. They are coercive forces, mimetic forces and normative forces. The survey questionnaire has been developed which will be used to test the theoretical model. All the data will be expectedly collected by the end of May, 2013 and then the structural equation model will be analyzed with PLS. From a theoretical perspective, the research model may be informative for researchers investigating the adoption of other technological standards, such as RFID tag, clouds-service. From the practical perspective, the research results may give some advice to government officials to promote the diffuse national e-government standards.

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REFERENCES

[1] Ray D., Gulla U., Dash S.S., and Gupta M.P.(2011). A critical survey of selected government interoperability frameworks, Transforming Government: People, Process and Policy, 5(2):114 -142

[2] Landsbergen D. and Wolken G.(2001). Realizing the promise: government information systems and the fourth generation of information technology, Public Administration Review, 61(2):206-20.

[3] Scott, W. R. (2001). Institutions and organizations London: Sage Publications.

[4] Kim S. et al.(2009). An institutional analysis of an e-government system for anti-corruption: The case of OPEN. Government Information Quarterly,26:42–50

[5] DiMaggio, P. J., Powell,W.W. (1983). Theironcage revisited: Institutional isomorphismand collective rationality in organizational fields. American Sociological Review, 48:147−160.

[6] Henderson D. et al. (2012). The determinants of inter-organizational and internal in-house adoption of XBRL: A structural equation model. International Journal of Accounting Information Systems,13: 109–140

[7] Teo H, Wei K, Benbasat I.(2003). Predicting intention to adopt: interorganizational linkages: an institutional perspective. MIS Quarterly, 27(1): 19–49.

[8] Basaglia S, Magni M. (2009). Environmental and organizational drivers influencing the adoption of VOIP. Information System and E-Business Management,7(1): 103–18.

[9] Son J, Benbasat I.(2007). Organizational buyers' adoption and use of B2B electronic marketplaces: efficiency and legitimacy-oriented perspectives. Journal of Management Information System, 24(1):55-99

[10] Ugrin J.C.(2009) The effect of system characteristics, stage of adoption, and experience on institutional explanations for ERP systems choice. Accounting Horizon, 23(4):365–89.

[11] Soares-Aguiar A, Palma-dos-Reis A(2008). Why do firms adopt e-procurement systems? Using logistic regression to empirically test a conceptual model. IEEE Transaction Engineer Management, 55(1):120–33.

[12] Kayya, J.O. (2006). Examining the Adoption, Implementation, Institutionalization and Sustainability of E-Government Strategies, phd thesis, University of Califoria.

[13] Khalifa M, Davison R.(2006) SME adoption of IT: the case of electronic trading systems. I IEEE Transaction Engineer Management,53(2):275–83.

[14] Cordery CJ, Fowler C, Mustafa K.(2011). A solution looking for a problem: factors associated with the non-adoption of XBRL. Pacific Accounting Review, 23(1):69–88.

[15] Roger,E.(2003). Diffusion of Innovations, New York: The Free Press.

[16] Goodstein, J.D.(1994). Institutional Pressures and Strategic Responsiveness: Employer Involvement in Work-Family Issues. Academy of Management Journal, 37:350-382

[17] King JL, et al.(1994). Institutional factors in information technology innovation. Information System Research, 5(2):139－169.