E-GOVERNMENT IMPLEMENTATION FRAMEWORKS: SUITABILITY AND APPLICABILITY

Sethunya Rosie Joseph*

Abstract

E-Government has been established as a key enabler of efficient online service provision to citizens and effective mechanism of increasing the productivity of many governments world over. It seems that governments world-wide are attempting to bring changes in the ways in which they offer their services. Governments are trying to use Information Communications and Technologies (ICTs) to achieve a better interaction between and among their local government and central agencies in providing new, efficient and convenient ways with their citizens and businesses in the acquisition of services. However, there are organisational, technological, political and social factors which surround the implementation of E-Government which needs to be taken into consideration and handled in a proper way in order to smoothly facilitate the implementation. Governments around the world have undertaken several initiatives in order to provide online services and information around the clock. They have designed and formulated E-Government implementation strategies, road maps and visions to do this, but the question is: are all this guided by any framework(s) or they are just writings on papers with ideas composed and put together guided by nothing? Hence, the purpose of this paper is to highlight and discuss some of the frameworks which could be useful, suitable and applicable in the implementation of E-Government. This paper which is based on document analysis will further highlight how the said frameworks are suitable and applicable to the E-Government implementation. This paper could be useful to those who are interested in learning about egovment implementation. It can also be a guide to policy makers and formulators of E-Government endeavour world-wide.

Keywords: E-Government, implementation, frameworks

* Department of Computer Science, Botswana International University of Science Engineering and Technology, Palapye, Botswana

1.INTRODUCTION

ICTs have played a crucial role in incrementally changing and shifting the traditional and bureaucratic government models into the current e-government model where services are delivered according to customers'needs (Al-Shafi, 2009). In describing e-government, as pointed out by Al-Shafi (2009) , literature highlights that the interpretation of e-government is based on technology (e.g. the use of ICT for delivery of government services electronically), process (e.g. processes of transaction and transformation of e-government services), benefits (e.g. benefits for delivery of government services electronically for the public), citizen focus (e.g. citizenry and their desires as a focal viewpoint), single point access (e.g. delivery of government services electronically through a single point of access), and phenomenon (e.g. e-government as a phenomenon and alternative way to deliver government service) (Al-Shafi, 2009).

According to Choudrie and Weerrakody (2007), E-Government encompasses a broad spectrum of activities (e.g. the capture, management, use, dissemination and sharing of seamless information) that are offered using ICT. They contend that all these factors allow for improved government service delivery to citizens. Similarly, Akman et al., (2005) support this argument and state that ICT has played an important role in transforming public service delivery from a bureaucratic paradigm into one based on personal needs.

E-Government, has become possible because of the advancement of telecommunication, the Internet and Information Technology (Siau& Long, 2005). Most countries are pushing towards achieving and having one stop service centre when it comes to service provision. The United Nations E-Government Survey 2012 finds that many have put in place e-government initiatives and information and communication technologies applications for the people to further enhance public sector efficiencies and streamline governance systems to support sustainable development. Among the E-Government leaders, innovative technology solutions have gained special recognition as the means to revitalize lagging economic and social sectors. As from the United Nations E-Government Survey report of 2012, Progress in online service delivery continues in most countries. Nevertheless, progress remains uneven. According to the report, in the current recessionary climate some countries have been better able to continue to invest in ICT infrastructure and service improvement. Others are evaluating the marginal utility of such

investment, especially taking into account low user uptake of existing services, and reassessing service portfolios where demand for online services is low. Many countries with low levels of infrastructure and human capital remain at lower levels of E-Government development with serious issues of digital divide. In all cases, E-Government take a prominent role in shaping development making it more in tune with people's needs and driving the whole process based on their participation.

According to Al-Shafi (2009), there are a number of motivations behind e-government implementation; **providing better services to customers** (Chircu and Lee, 2005;Davison *et al.*, 2005; Navarra and Cornford, 2005; Wong and Welch, 2004; Silcock, 2001); **centralisation of e-government agencies** (Gunasekaran and Ngai, 2008; Al-Khouri and Bal, 2007; Ndou, 2004; Seifert and Petersen, 2002; Layne and Lee, 2001); economic development (Gil-García and Pardo, 2005; Jaeger, 2003); **efficiency and cost reduction** (Gupta *et al.*, 2008; Gil-García and Pardo, 2005; Jaeger, 2003; NECCC, 2000); reducing corruptions (Kim *et al.*, 2009; Al-Khouri and Bal, 2007; InfoDev, 2002) and creating a more participative form of government by encouraging online debating, voting and exchange of information (Davison, *et al.*, 2005; Carter and Belanger, 2005; InfoDev, 2002; Reynolds and Regio-Micro, 2001; Bonham *et al.*, 2001).

The major issue in the development of e-government is to maximise the benefits and make use of any expanding opportunity for future improvement (Al-Shafi, 2009). Al-Shafi argues further that, when e-government is well established, continuous monitoring for improvement would be needed. As with any other new technology or organisational concept, the introduction of e-government to a country will also result in a number of challenges. Like many other ideas that have arisen during the nascent stages of the internet age, e-government is a concept that is seemingly in a constant state of development (Al-Shafi, 2009). However, as pointed out by Affisco and Soliman (2006), with the advent of the e-government concept in the recent years, public sector organisations around the world have realised the importance of making their services more efficient, effective and accessible, i.e. revolutionising the governments' interactions with their different stakeholders.

2. PAPER OBJECTIVE

The aim of this paper is to highlight and discuss frameworks which could be suitable and useful for the implementation of E-Government.

3. METHODOLOGY

The information used to compile this paper was mainly obtained from several literatures. These include journal articles, seminar and conference papers, empirical studies, books, Internet websites and blogs.

4. FINDINGS

This section discusses the frameworks that could be used and applied in the studies involving the implementation of E-Government which are: Institutional theory; Technology, Organisation and Environment Framework and Enactment Technology Framework.

Institutional Theory

Berger and Luckman's work of 1967 is the basis for modern Institutional theory (Scott, 2001). According to Berger and Luckmann (1967a), social reality is a human construction created through interaction. Moreover, like other change theories, Institutional theory has historically explained why organisational structures and values endure (Robey & Boudreau, 1999). Institutional theory consists of three mechanisms: These are: regulatory or coercive, cognitive or mimetic, and normative (DiMaggio & Powell, 1983; Scott, 2001; Kim, Kim & Lee, 2009). These mechanisms are seen as independent and alternative sources of organisations structuring. A regulatory or coercive mechanism is based on political and legislative influences.

According to Kim, Kim and Lee (2009), the regulatory factors are affected by politics and legislations, and influenced by firms's decisions to adopt a specific organisational practice. Hoffman and Ventresca (2002) describe how organisations emphasize legitimation processes and have the tendency to institutionalise organisational structures and procedures following legislations. A mimetic mechanism refers to copying other systems's practices (DiMaggio & Powell, 1983; Scott, 2001). It functions when uncertainty is prevalent, at a point which organisations are likely to model themselves on other organisations or refer to culturally

presumed meanings and ideologies. A normative mechanism is motivated by norms that are rampant and observed in the realm to which the organisations belong (Kim, Kim & Lee, 2009). Institutions are made up of many elements with processes through which structures are maintained and modified towards consistencies within or across organisations over time (Scott, 2001). The consistency often means upholding norms. For instance, organisations often take actions, not because of economic considerations, but because they are expected to follow industry norms.

Institutional theory applicability to eGovernment

Institutional theory has various roots and variants and has been applied in many areas of study (Scott, 1987; DiMaggio & Powell, 1991). In the study of technology, Institutional theory aims to explore the creation, design, and use of advanced technologies that are bound up with the forms and direction of social order (Hoffman, 2001). As pointed out by Silva and Figueroa (2002), the theory requires the study of technology, including E-Government systems, to focus on interaction between people and the system, and to capture historical processes as social practices evolve. These social practices and processes are executed by the interactions among actors or stakeholders such as unions, investors, shareholders, financial institutions, customers, intermediaries, suppliers, academic institutions, business associations, and social activists (Hoffman, 2001; Silva & Figueroa, 2002).

When applied in the context of eGovernment, Institutional theory can help identify challenges surrounding the implementation of E-Government systems. As highlighted by Kim, Kim and Lee (2009), through examining the three mechanisms of institutionalisation, the theory elucidates how an innovation or new system developed in an organization is diffused, adopted, or copied by others. Hence, the wider social and political dimensions and the regulatory and normative mechanisms proposed in Institutional theory, offer a well-balanced conceptual frame of reference for understanding the institutional changes and associated challenges faced by E-Government implementation (Kim, Kim & Lee, 2009).

Researchers such as Hu et al., (2006), Teo et al., (2003), Tingling and Parent (2002) ,Haveman (1993), Mezias (1990), and Zucker (1977) have used Institutional theory to explain the influence of various social, political and technology phenomena on organisations. In particular, the

political, social and technology aspects that influence E-Government change (Kim, Kim & Lee, 2009 & Yildiz, 2007). Cavalluzzo and Ittner (2004) discuss how government organisations often implement management control systems to meet legislative requirements, but do not use these systems for internal improvements. Cavalluzzo and Ittner use Institutional theory to conjecture how the limited perceived benefits realised from mandated organisational changes, in government organisations tends to be symbolic, but have little effect on internal operations.

Technology Enactment Framework

Technology Enactment Framework (TEF) was introduced by J.E. Fountain in 2001. TEF is recognized as the framework used to analyse the influence of organisational structures and institutional settings on implementation of ICT in public organisation and adoption by governments (Fountain, 2001; Schellong, 2007; Yildiz, 2007; Bwalya et.al., 2012). It helps to analyse the implementation of the IT and its impact on government organisations (Dangol, 2012; Danziger, 2004).

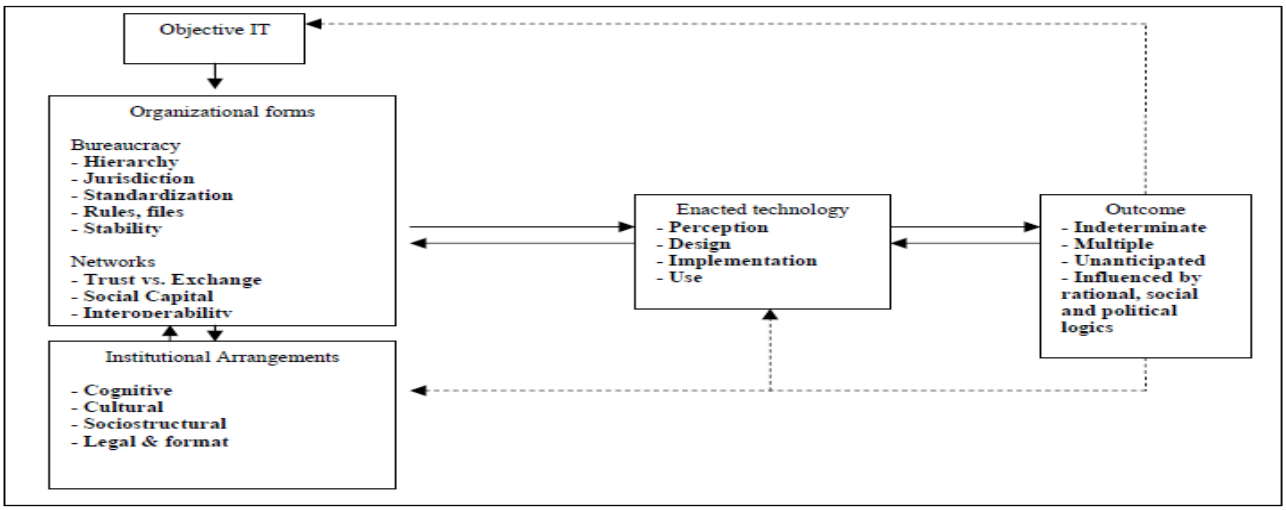

Figure 1: Fountain's Technology Enacted Framework adopted from (Schellong, 2007)

According to the framework, both organisation's environment (e.g., structure) and behaviour of key actors determine the technology being enacted and its outcomes. The 'Objective IT' represents the hardware and software elements of IT (Tsai, Choi & Perry, 2009). The 'Organisations forms' (e.g., bureaucracy or networks) refers to the context of IT use that affects how IT is enacted (Dangol, 2012; Danziger, 2004).

The 'Enacted technology' captures the actor's perception, design, implementation and use of IT, where the actor's perception is influenced by 'institutional arrangements' that may include cognitive, cultural, legal factors, etc (Dangol, 2012; Danziger, 2004;Tsai, Choi & Perry, 2009). The 'Outcome', which can be direct or indirect, is for actors to recognise the impact of enacted technology that in turn affects the organisations forms, institutional arrangements and enacted technology (Schellong, 2007).

The TEF has been applied to case studies of E-Government implementation mostly at the federal level using both inter-agency and intra-agency aspects (Danzieger, 2004). It proves to be useful for investigating the context of eGovernment, as well as for generating the strategies, due to the innovation of Information and communication technologies in the organisation (Fountain, 2001; Danzieger, 2004; Tsai, Choi& Perry, 2009).

Technology Organisation Environment Framework

Technology Organisation Environment Framework (TOEF) is described in Tornatzky and Fleischer's The Process of Technological Innovation (1990). TOEF posits three aspects of an organisation's context that influence the process by which it adopts and implements a technological innovation. These aspects are: technological context, organisational context and environmental context (Baker, 2012).

Technological context describes both the internal and external technologies relevant to the firm (Zhu, Kraemer, Xu, & Dedrick, 2004). These include existing technologies inside the firm, as well as the pool of available technologies in the market (Jupan & Yuhjang, 2008; Chang, Li-liao & Hsiao, 2004). The decision to adopt a technology depends not only on what is available on the market, but also on how such technologies fit with the technologies that a firm already possesses (Tornasky & Fleischer, 1990; Chau & Tam.1997; Jeyraj et al., 2006).

Organisational context is defined in terms of several descriptive measures: firm size and scope (Iacovou et al., 1995); the centralization, formalization and complexity of its managerial structure (the quality of its human resources; and the amount of slack resources available internally (Jeyaraj et al, 2006; Zhu, Kraemer & Xu, 2006). Thus, factors internal to an organization influencing an innovation adoption and implementation (Tornatzky & Fleischer, 1990). Environmental context is the arena in which a firm conducts its business-: its industry,

competitors, access to resources supplies by others and dealings with government (Tornatzky & Fleischer 1990:152-4; Xu, Zhu & Gibbs, 2004).

The TOE framework has been examined by a number of empirical studies on various Information systems (IS) innovations (for a literature review of empirical support for TOE framework, see Zhu et al 2003). The TOE framework has been found useful in understanding the adoption of technological innovations (Baker, 2012; Chau & Tam, 2005, Zhu, Kraemer & Xu, 2003, Zhu, Dong, Xu & Kraemer, 2006; Gibbs & Kraemer, 2004; Xu, Zhu & Gibbs, 2004; Hong & Zhu, 2006; Zhang, Cui, Huang & Zhang, 2007). For instance, Kuan and Chau applied the TOE framework to study EDI adoption in small businesses (Kuan & Chau, 2001). Hong and Zhu examined six variables based on the TOE framework to successfully differentiate non adopters from adopters of e-commerce (Hong & Zhu, 2006). Zhu et al. studied how TOE factors influenced e-business assimilation at the firm level (Zhu, Xu& Kraemer, 2006; Zhu, Dong, Xu& Kraemer, 2006).

The TOE framework provides a good starting point when analysing and considering suitable factors for understanding the innovation-adoption decision, because it has many consistent empirical supports (Wang, Wang & Yang, 2010). Table 2 summarizes the relevant studies based on the TOE framework.

Study	Innovation studied	Determinants
Chau and Tam [20]	Open system	● Technology: perceived benefits; perceived barriers; perceived importance of compliance to standards, interoperability, and interconnectivity ● Organization: complexity of IT infrastructure; satisfaction with existing systems; formalization on system development and management ● Environment: market uncertainty
Zhu et al. [22]	E-business	● Technology: technology competence ● Organization: firm scope; firm size ● Environment: consumer readiness; competitive pressure; lack of trading partner readiness
Zhu et al. [23]	E-business	● Technology: technology readiness; technology integration ● Organization: firm size; global scope; managerial obstacles ● Environment: competitive intensity; regulatory environment
Zhu et al. [24]	E-business	● Technology: relative advantage; compatibility, costs and security concern ● Organization: technology competency; organizational size ● Environment: competitive intensity; partner readiness
Gibbs and Kraemer [28]	E-commerce	● Technology: technology resources ● Organization: perceived benefits; lack of organizational compatibility; financial resources; firm size ● Environment: external pressure; government promotion; legislation barriers
Hong and Zhu [29]	E-commerce	● Technology: technology integration; web functionalities; EDI use ● Organization: web spending; perceived obstacles ● Environment: partner usage
Kuan and Chau [30]	EDI	● Technology: perceived direct benefits; perceived indirect benefits ● Organization: perceived financial cost; perceived technical competence ● Environment: perceived industry pressure; perceived government pressure
Zhang et al. [31]	IT usage	● Technology: IT infrastructure ● Organization: IT management ● Environment: e-government; government regulation and promotion
Xu et al. [32]	Internet	● Technology: technology competence ● Organization: firm size; global scope; enterprise integration ● Environment: competition intensity; regulatory environment

Table 2: Previous studies using the TOE framework in investigation of the adoption of the technological innovation adopted from (Wang, Wang & Yang, 2010).

Based on the empirical evidence from aforementioned studies, combined with literature review and theoretical perspectives discussed earlier, it can be argued that the TOE framework can be used for studying E-Government implementation. E-Government is enabled by the technology, driven by organisations factors such as firm size and management support, and influenced by environmental factors related to business partners and competitors.

5. References

Akman, I., Yazici, A., Mishra, A. & Arifoglu, A. (2005) E-Government: A global view and anempirical evaluation of some attributes of citizens. Government Information Quarterly,22, 239-257.

Al-shafi, S.H. (2009). Factors Affecting E-Government Implementation And Adoption In The State Of Qatar. A Thesis Submitted for the Degree of Doctor of Philosophy at the Department of Information Systems and Computing Brunel University.

Berger, P. L. & Luckmann, T. (1967a) The construction of reality. A Treatise in the Sociology of knowledge. Doubleday, Anchor Books., Garden City, NY.

Baker,J.(2012).The TOEF: Information Systems Theory-:Explaining and predicting our digital society.Volume 1 series 28.pp231-245.Springer.New York.(book)

Bwalya K., Zulu S., Grand, B., & Sebina, P. (2012) "e-Government and Technological Utopianism: Exploring Zambia's Challenges and Opportunities" *Electronic Journal of e-Government*, 10 (1), pp16 - 30, available online at www.ejeg.com

Cavalluzzo & Ittner (2004) In: Kim, S., Kim, H., J & Len, H.(2009). An institutional analysis of an e-government system for Anti-corruption: The case of OPEN. *Government Information Quarterly* 26, 42–50

Chang,T., liao, L& Hsiao,F.().An Empirical Study on the e-CRM Performance Influence Model for Service Sectors in Taiwan. Available online: http://

Chau, P. Y. K., & Tam, K. Y. (2005). Factors affecting the adoption of open systems: an exploratory study, *MISQuarterly*, 21(1), pp. 1-24.

Choudrie, J. & Weerrakody, V. (2007) Horizontal process integration in e-government: the perspective of a UK local authority. *International Journal of Electronic Government Research*, 3, 22-39.

Dangol, S. (2012). E-government based land Information systems architecture: A case of Nepal. *A thesis submitted for the degree of Master of science in geo-information Science and Earth*. Available at: http://www.itc.nl/library/papers_2012/msc/la/dangol.pdf. Accessed: 18 February 2014

Danziger, J. N. (2004). Innovation in innovation: The technology enactment framework. *Social Science ComputerReview*, 22(1), pp 100-110.

DiMaggio, P. J., & Powell, W. W. (1991). Introduction. In W. W. Powell & P. J. DiMaggio(Eds.), The New Institutionalism in Organizational Analysis. Chicago: The University of Chicago Press.In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly*, 26, pp 42–50

DiMaggio, P. J.,&Powell,W.W. (1983). Theironcage revisited: Institutional isomorphismandcollective rationality in organizational fields. American Sociological Review, 48, 147−160. In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly*, 26, pp 42–50

Fountain, J. E. (2001). Building the virtual state: Information technology and institutional change Washington, DC: Brookings Institution Press.

Haveman (1993): In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly*, 26, pp 42–50

Hoffman, A. J. (2001). Linking organizational and field-level analyses. *Organization and Environment*, 14(2), pp 133−156.

ternet-based e-commerce: factors affecting e-commerce adoption and migration at the firm level, *Information and Management*, 43 (2), pp 204–221.

Hu et al., (2006): In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly* 26, pp 42–50

Iacovou, C.,L, Benbasat, I & Dexter, A.(1995).Electronic data interchange and small organizations: adoption and impact of technology, MIS Quarterly 19 (4) pp 465–485.

Jeyaraj, A., Rottman, J., Lacity, M.J (2006), A review of the predictors, linkages, and biasesin IT innovation adoption research. *Journal of Information Technology*, 21(1),pp 1-23.

Pan, M,J & Jang, W.Y (2008). Determinants Of The Adoption Enterprise Resources Planning Within The Technology-Organisation-Environment Framework: Taiwan's communications industry. *Journal of Computer Information Systems*, Spring 2008. pp 94-102

Kim, S., & Cho, K. (2005). In M. A.Wimmer (Ed.), Achieving administrative transparency throughinformation systems: A case study in the Seoul Metropolitan Government (pp. 113−123).

Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly* 26, pp 42–50

Kuan, K. K. Y & Chau, P. Y. K.. (2001). A perception-based model for EDI adoption in small business using a technology-organization-environment framework, *Information & Management*, 38,(8) , pp.507-521.

Mezias (1990): In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly* 26, pp 42–50

Robey, D. & Boudreau, M. C. (1999) Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. *Information systems research,* 10**,** 167.

Schellong, A. (2007).Extending the Technology Enactment Framework. Program on Networked Governance Working Paper No.PNG07-003.
Scott, W. R. (1987). The adolescence of institutional theory. Administrative Science Quarterly, 32, 493−511: Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly* 26, pp 42–50

Scott, W. R. (2001). Institutions and organizations London: Sage Publications. Seoul.In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. Government Information Quarterly 26, pp 42–50

Siau, K & Long, Y. (2005) .Synthesizing e-government stage models e a meta-synthesis based on meta-ethnography approach., Industrial Management and Data Systems, *The Electronic Journal on Information Systems in Developing Countries* , 105(1), pp. 443.

Silva, L., & Figueroa, B. (2002). Institutional intervention and the expansion of ICTs inLatin America: The case of Chile. *Information Technology and People,* 15(1),pp 8−25.

Teo, T.S.H., Srivastava, S.C. & Jiang, L. (2009). Trust and Electronic Government Success: An Empirical Study, *Journal of Management Information Systems,* 25(3), pp. 99-131.

Tornatzky, L. G., & Fleischer,M. 1990. *The Process of Technological Innovation*. Lexington, KY: Lexington Books. In Baker,J.(2012).The TOEF:Information Systems Theory-:Explaining and predicting our digital society.Volume 1 series 28.pp231-245.Springer.New York.(book)

Tsai, N., Choi, B., & Perry, M. (2009).Improving the process of E-government initiative: An in-depth case study of web-based GIS implementation, *Government Information Quarterly*, 26, pp 368-376.

United Nations E-Government Survey 2012.

Wang, Y., Wang, Y. & Yang, Y. (2010).Understanding the determinants of RFID adoption in the manufacturing industry. *Technological Forecasting & Social Change*, 77 (2010), pp 803-815

Xu, S., Zhu, K. & Gibbs, J. (2004). Global technology, local adoption: a cross-country investigation of Internet adoption by companies in the United States and China, *Electron Markets* 14 (1) pp 13–24.

Yildiz, M. (2007). E-government research: Reviewing the literature, limitations, and ways forward, *Government Information Quarterly*, 24(4) pp. 646-665.

Zhu, K., Xu, S., and Dedrick, J. (2003). Assessing drivers of e-business value: results of a cross-country study," Twenty-Fourth International Conference on Information Systems, 18(2) pp 1-24.

Zhu,K , Kraemer ,K.L, & Xu,S., (2003) Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors,, *Eur. J. Inform. Syst*.12 (4), pp 251–268.

Zhu, K. , Kraemer, K.L. & Xu, S. (2006). The Process of Innovation Assimilation by Firms in Different Countries: A Technology Diffusion Perspective on E-Business. *Management Science*, 52(10), pp 1557-1576. http://dx.doi.org/10.1287/mnsc.1050.0487

Zhu,K., Dong, S.. Xu, S.X & Kraemer, K.L. (2006). Innovation diffusion in global contexts: Determinants of post-adoption digital transformation of European companies,Eur. J. Inform. Syst. 15(6), pp 601–616.

Zucker (1977) : In Kim, S., Kim, H., J & Lee, H. (2009). An institutional analysis of an e-government system for anti-corruption:The case of OPEN. *Government Information Quarterly* 26, pp 42–50