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Calvin M. L. CHAN

Yi Meng LAU
Singapore Management University, ymlau@smu.edu.sg

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An Informatization of Society Approach to e-Government: Analyzing Singapore's e-Government Effort

Calvin M. L. Chan
Department of Information Systems
National University of Singapore
cchan@comp.nus.edu.sg

Yi Meng, Lau
School of InfoComm Technology
Ngee Ann Polytechnic
lym5@np.edu.sg

Abstract

Despite the much publicized benefits of e-government, many countries are experiencing difficulty in yielding success in their e-government initiatives. Studies which adopt the national e-government initiatives as the unit of analysis remain largely rare. This paper aspires to provide an analysis of Singapore's widely acclaimed success in the e-government effort at the national level to allow other countries to learn and gain from its experience. Using the 'Conceptual Framework for the Informatization of Society' in facilitating the data analysis, implications are drawn to offer insights for the considerations of e-government practitioners. Theoretical implications are also derived through positing that the framework can be adapted as an integrative lens for the understanding of the e-government phenomenon as well as the integrative sense making of existing research on e-government. In conclusion, the limitations of this study and opportunities for future research are discussed.

Keywords: e-Government, Informatization of Society, Singapore

1. Introduction

ICT is increasingly being known as a significant tool for 'reinventing government' where the capabilities of the Government in serving their citizens are greatly expanded (Norris and Moon 2005). Some of these improvements include greater customer centricity, enhanced efficiency and effectiveness, and reduced bureaucracy (Chan et al. 2003). Billion of dollars have been invested in the development of e-government which is defined here as the provision of information and services by governments through various digital means (West 2004).

Nevertheless, studies have indicted that the promised benefits of e-government have remained an illusive dream for many Governments (Ke and Wei 2004). Given that Singapore has consistently been rated among the leaders in e-government implementation (e.g. Accenture 2004; Dutta et al. 2004), it would thus be beneficial to explore *what are the strategies in achieving e-government success* in Singapore. This paper will attempt to provide an analysis of Singapore's e-government effort at the national level to allow other countries to learn and gain from its experience. The result of this analysis indicates that the national e-government strategy adopted by Singapore corresponds with the informatization of society approach, which focuses on the creation of an information society. Moreover, it is also posited that the 'Conceptual Framework for the Informatization of Society' can be further adapted to provide an integrative framework for e-government.

The next section will provide a brief literature review on e-government, before proceeding to describe the informatization of society approach. Prior to presenting the analysis of Singapore's national e-government strategy, the methodology employed for this study is first explained. This is followed by a discussion and implications section and then the conclusion.

2. E-Government

The public sector has been utilizing ICT to support its operations since the early days of the increasing ubiquity of ICT (Kraemer and Perry 1979). The arrival of the Internet has provided an opportunity for the government to exploit ICT in expanding their service provision capabilities, thus giving birth to new terminologies such as 'online government' and 'digital government' in describing such a novel phenomenon. Nonetheless, the term that has since gained wide acceptance is 'e-government'.

As scholars began to take interest in studying this nascent e-government phenomenon, literature on e-government began to sprout in the publication outlets of various disciplines ranging from public administration (West 2004), information systems (Tan and Pan 2003) to even business (Clark 2003) and social science (Hasan 2003). Moreover, calls were made for more empirical and practice-relevant works to be generated as the bulk of existing literature is theoretically oriented (Norris and Moon 2005). This paper, which presents an analysis that is drawn from the actual e-government effort in Singapore and addresses the practical issue of e-government implementation, can thus to be deemed as a respond to these calls.

The unit of analysis of most empirical e-government studies are at the individual projects level (e.g. Chan et al. 2003) or focusing on the adoption of e-government (e.g. Becker 2005), with few taking a macro-level unit of analysis such as the national e-government strategy. This may explain why many countries are experiencing difficulty in attaining significant success in their e-government effort (Ke and Wei 2004) as documented knowledge on successful national e-government strategy are scarce. Therefore, this paper will also contribute towards easing the difficulties experienced by many countries through offering insights from the analysis of Singapore's national e-government implementation approach.

3. Informatization of Society

Towards the end of the last millennium, much has been professed about the arrival of a post-industrial society (Bell 1977), where the increased diffusion of ICT is often highlighted. Technology has induced changes in the ways goods and services are produced and distributed (Al-Hawamdeh and Hart 2002), changes to culture (De Mul 1999) and the heightening of customers' expectations. Work processes have correspondingly become more information and knowledge intensive, requiring a larger numbers of educated knowledge workers in such societies. With greater emphasis placed on information, the post-industrial society has variably been referred to as the 'information society' or 'information economy'. In this paper, *information society* will be the adopted term.

The transformative process of progressing into an information society is known as the informatization process (De Mul 1999; Wong 1998). In articulating the informatization process, Wong's (1998) conceptual framework of information economy is adapted for this purpose and is presented graphically as the 'Conceptual Framework for the Informatization of Society' in Figure 1. According to Wong (1998), the origin of the informatization process can be traced to the creation of two components, *ICT goods* and *information content*. *ICT goods* can be understood as the ICT hardware and the requisite software needed to operate the ICT hardware. *Information content* refers to the multimedia content and informational web pages which provide the substance for the *ICT goods*. To be practically useful, *ICT goods* and *information content* will have to be combined to form a *network infrastructure* (Wong 1998). An example of a *network infrastructure* is the Internet. Another example of *network infrastructure* that has been noted to contribute towards the informatization of society is National Information Infrastructures (NII) (Caidi 2004).
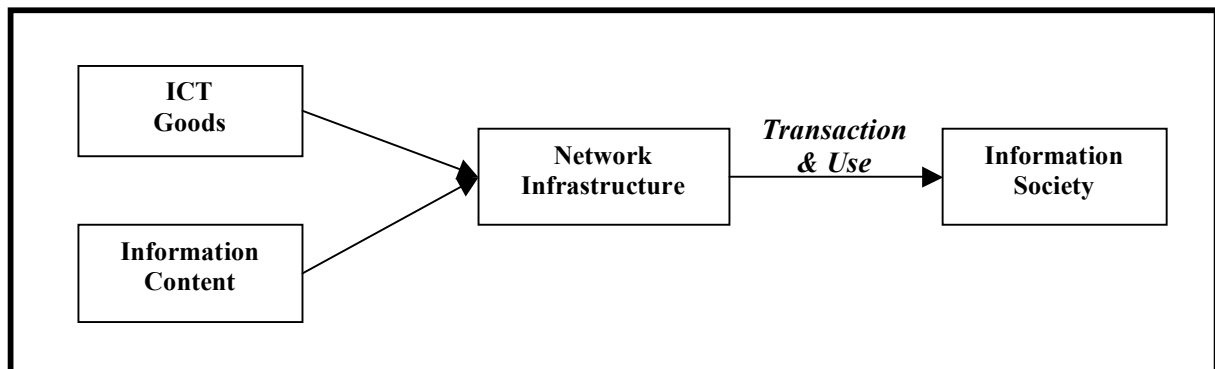
Figure 1: Conceptual Framework for the Informatization of Society

However, the mere presence of even the most superb *network infrastructure* is still unable to directly bring forth an *information society*. In order to arrive at an *information society*, the *network infrastructure* will have to be used by members of the society. Thus, one indicative measure of an *information society* is the extensive *transaction and use* of the *network infrastructure*. This is actually one established indicative measure used in assessing the maturity of an economy (e.g. Dutta et al. 2004).

4. Research Method

The intention of this study is to examine *what are the strategies in achieving e-government success* through an analysis of Singapore's e-government effort at the national level. The primary source of data was taken from a variety of publicly available government documents and publications, similar to what Wong (1998) adopted. An interpretive approach (Walsham 1995) is adopted during data analysis and it focuses on the sense making of Singapore's e-government effort through which Singapore's e-government effort were understood inductively. Adding to the rigor of this analysis, the 'Conceptual Framework for the Informatization of Society', shown in Figure 1, is applied in interpreting the data.

5. Data Analysis: Singapore's E-government as Informatization of Society

5.1 ICT Goods

Motivated by the need to provide a comprehensive technological system for all the ministries and agencies of the Singapore Government to develop, deploy and operate e-government services in an efficient and speedy manner, the Singapore Government constructed the Public Service Infrastructure (PSi). Through facilitating data sharing across the silos of Government and eliminating duplicative information entries, PSi enabled the Government to act as one united entity to the citizens. As one director from the Infocomm Development Authority (IDA), which manages the national e-Government Action Plan (eGAP), shared: *"To put services online is not so simple as putting up a website, we need a lot of infrastructure that people don't see…We have built the PSi around a common set of tools basically because the different government agencies and their legacy systems present us with too many interfaces if we had to integrate all of them"*.

One senior officer from the Ministry of Finance (MOF), the operational owner of eGAP, elaborated on the utility of PSI: *"the infrastructure [PSi] helped to speed up the process tremendously. We are making use of the pre-programmed modules that allowed…[us] to come up with the e-services quickly, instead of building from scratch."*

5.2 Information Content

Solely having *ICT goods* is insufficient. It must be coupled with *information content* for it to be of value. In conceptualizing the development of *information content*, the Singapore Government devised a five stage model to articulate the directions for achieving sophisticated and customer oriented online services (i.e. e-services) as represented in Table 1. From 2000 to 2003, the focus was on implementing the 'Publish', 'Interact' and 'Transact' stages. In 2003, the focus was escalated to focus on the 'Integrate' stage, with the '3P Integrate' stage introduced in late 2004.

Stages	Focus
Publish	Publishing informational content in web format.
Interact	Fulfilling part of the service online.
Transact	To have the entire service fulfilled online.
Integrate	To have related individual services are integrated together.
3P Integrate	To have integrated services from the government agencies and ministries, the private sectors and the people sectors.

Table 1: Five Stage Online Content Development Model

5.3 Network Infrastructure

Up till 2004, the e-Citizen portal (http://www.ecitizen.gov.sg/), has been positioned as the *network infrastructure* for e-government in Singapore. However, as the e-Citizen Portal emphasizes on the individual citizens, the Singapore Government has repositioned the Singapore Government Online portal (SINGOV) (http://www.gov.sg/) as the *network infrastructure* of e-government on 28 October 2004. Apart from individual citizens, SINGOV also dedicate attention to business entities as well as non-residents. SINGOV has since become the default launch pad to about 1,600 government related information and services in Singapore.

Following the 'Conceptual Framework for the Informatization of Society' described in Figure 1, the *ICT infrastructure* (i.e. PSi) and the *information content* (i.e. e-services at the various stages) are combined into the *network infrastructure* (SINGOV). In another words, from SINGOV (i.e. *network infrastructure*), the public can access all the various e-services (i.e. *information content*) that are developed and hosted on PSi (i.e. *network infrastructure*).

5.4 From Transaction and Use to Information Society

One indicative measure of an *information society* is the extensive *transaction and use* of the *network infrastructure*. Statistics by IDA have shown a steady increase of individual computer users (1.8%) and Internet users (5.7%) over the last three years. Online government services have been consistently ranked as the most popular, with an increase of 13.9% since 2002. Singapore has also been ranked highly internationally as the most ICT savvy nation in the world. It is thus evidenced that an *information society* is emerging in Singapore.

The popular *transaction and use* of government e-services in Singapore may be attributed to the various initiatives organized by the Singapore government (e.g. road shows, lucky draw). For example, to benefit those without Internet access or may be ICT illiterate, the Government has launched an e-Citizen Helper Service to render free assistance and put in place the National IT Literacy Programme to impart basic ICT skills. When placed in perspective with the launch of SINGOV, there is little doubt that these initiatives would have facilitated the widespread *transaction and use* of SINGOV (i.e. *network infrastructure*) to propel Singapore towards an *information society*.

6. Discussion

As mentioned at the beginning, this paper attempts to provide an analysis of Singapore's e-government effort at the national level so that other countries can learn and gain from its experience. Thus, the discussion here will first focus on drawing practical implications from the analysis of data presented above before proceeding to discuss the theoretical implications.

In applying the 'Conceptual Framework for the Informatization of Society' to analyze Singapore's e-government effort, this study has demonstrated that the framework can effectively be used as an integrative lens for the sense making of e-government effort to help governments focus on the different key aspects of an integrated e-government initiative. By separating SINGOV (*network infrastructure*) into its component parts of PSi (*ICT goods*) and e-services (*information content*), the conceptual framework has more accurately reflected that any turnkey e-government solution may need to have a robust and integrative *ICT goods* as well as clear guidelines on the development of high-quality *information content*.

PSi has not only provided a secure hosting environment for e-services, it has also offered an efficient environment for the development of new e-services. Moreover, PSi also affords greater flexibility and robustness as new technologies (e.g. mobile services) can also be incorporated subsequently. Thus, any countries that hope to roll-out robust e-services in an integrative and expeditious manner liken to that in Singapore should seriously consider the construction of turnkey e-government *ICT goods* like the PSi. In terms of *information content*, the Five Stage Online Content Development Model has helped government ministries and agencies to be focused in developing customer centric e-services. Guidelines used for the creation of *information content* should also be reviewed and updated as e-government effort progresses. For the *network infrastructure*, Singapore's experience indicates that a revamp may be required to allow for greater complexity in the country's e-government effort. The willingness to abandon what is tried and tested is one key quality. To encourage the *transaction and use* of government e-services, promotional activities design by the Singapore Government to bridge the digital divide can be adapted accordingly by other countries. Though countries may have different degree of digital divide, *transaction and use* of e-government should never be relegated as an afterthought in any e-government initiatives.

Area	Corresponding Research Area in e-Government	Examples of Existing Literature
ICT Goods	Research on ICT systems, products and devices that are utilized in/for e-government.	Chen et al. (2002), Golubchik et al. (2003), Gordon and Richter (2002)
Information Content	Research on e-government information and e-service content and design.	Cottam et al. (2004), Ebrahim et al. (2004)
Network Infrastructure	Research on the integrative e-government infrastructure and the accompanying process and policy issues.	Allen et al. (2001), Bannister (2001), Kawalek and Westell (2005), Tan and Pan (2003)
Transaction & Use	Research on the adoption and usage of e-government as well as the e-government promotional effort and strategies to bridge the digital divide.	Becker (2005), Carter and Belanger (2004), Hinnant and O'Looney (2003), Huang et al. (2002)

Table 2: A Mapping of Existing Literature and the Framework

From a theoretical angle, the understanding of e-government effort as composing of *ICT goods*, *information contents*, *network infrastructure* and *transaction and use* offers a novel

and integrative theoretical approach in the sense making of the e-government phenomenon. Researchers have observed the need for some form of a generic framework for the understanding and organization of e-government research (Grant and Chau 2005), thus the 'Conceptual Framework for the Informatization of Society' can be adapted to provide an integrative conceptual framework for the sense making of the e-government phenomenon. The feasibility of this has been demonstrated in the above analysis on Singapore's e-government effort. For it to be truly useful, it will also have to exhibit certain degree of coherence with the existing literature on e-government. An abridged mapping of existing literature to the framework is provided in Table 2.

7. Conclusion

The primary aspiration of this paper is to provide an analysis of Singapore's e-government effort at the national level, which is achieved through studying *what are the strategies in achieving e-government success* in the case of Singapore. The 'Conceptual Framework for the Informatization of Society' is used to facilitate the data analysis where practical implications were then drawn from. In addition, theoretical implications on the suitability of adapting the framework as an integrative lens for e-government were posited. In supporting this position, a mapping is done for each area in the framework to corresponding e-government literature.

Notwithstanding, there are still limitations to this study which presents opportunity for future research. The data analyzed here was taken solely from Singapore and at a national level, thus it remains to be established that the framework will be suitable for analyzing e-government in other countries and other administrative settings. Future research could therefore extend this study by examining the utility of the framework under different administrative and national boundaries. Comparative analysis could also be done against the case of Singapore.

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