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ABSTRACT

Over the years, more and more sophisticated e-government systems are being created to reach out to both businesses and citizens alike. However, many such projects have been fraught with difficulties due to myriad barriers which may hinder adoption and inhibit progress during the various phases of the implementation. Against this backdrop, an example of a country with an advanced e-government agenda and a successful track record is Singapore.

In this study, we first propose a 3-stage theoretical framework that takes into account the barriers that may hinder a successful e-government implementation and the corresponding change intervention actions to address such barriers. We then demonstrate and refine the applicability of the proposed framework in the context of the Singapore Government's experience in implementing the CORENET project in the construction and real estate industry. The insights gained and the lessons learnt from this study may have valuable implications for research and practice.

Keywords

e-Government, adoption barrier, planned change, construction industry

INTRODUCTION

Information technology (IT) is bringing about a paradigm shift in the way governments deliver public services. As effectiveness, efficiency, and responsiveness become yardsticks to measure the performance of governments in democracies, the push to innovate by leveraging on IT has become more intense. In particular, more and more sophisticated e-government systems are being created to reach out to both businesses and citizens alike. However, not all e-initiatives undertaken by the government are successful (Lee and Clark, 1996-97; Kambil and Heck, 1998). Many such projects have been fraught with difficulties due to myriad barriers which may hinder adoption and inhibit progress during the various phases of the implementation. The probability of failure seems especially high if the new e-initiatives are inter-organizational systems with many parties involved and requiring substantial redesign of the current organizational norms and established work processes. Some barriers are tangible, like the lack of resources, while others are intangible, like user resistance to the system. Against this backdrop, an example of a country with an advanced e-government agenda and a successful track record is Singapore.

In organizational literature, firms have used a variety of change intervention actions to eliminate barriers that impede the firm from implementing new systems or conducting business process re-engineering (Huy, 2001). Governments, having substantial market power in certain industries and the power of mandatory authority in their own countries, will have more options to deal with and eliminate such barriers as compared to private organizations. Instruments of institutional invention have been used in several countries to promote the objectives of the government (King, Gurbaxani, Kraemer, McFarlan, Raman and Yap, 1994). Therefore, it is important to explore how various change intervention actions relate to different adoption barriers and how the government can use such intervention strategies to address these barriers.

Roadmap of Paper

We begin with a review of the literature on e-government and planned change. We next propose a theoretical framework that takes into account the barriers that may hinder a successful e-government implementation and the corresponding change

intervention actions to address such barriers. We then demonstrate and refine the applicability of the proposed framework in the context of the Singapore Government's experience in implementing the CORENET project in the construction and real estate industry. We conclude with implications for research and practice.

LITERATURE REVIEW

e-Government can be narrowly defined as the production and delivery of government services through IT applications, or more broadly as any way IT is used to simplify and improve transactions between government and other actors, such as consultants, businesses, and other governmental agencies (Sprecher, 2000). The concept of interoperability of information between different public agencies using networking technology and its potential benefits and barriers has been explored by Lansbergen and Wolken (2001). Government's desire to innovate can perhaps be due to its aim to become more effective and efficient. Effectiveness, efficiency and responsiveness are often used as yardsticks to measure the performance of governments in democracies (Grönlund, 2001; Lansbergen and Wolken, 2001; Watson and Mundy, 2001).

Implementing e-government can be considered as a process of planned change. Process of change in organizations has many different perspectives which include a situated change perspective (Orlikowski, 1996), concept of punctuated equilibrium (Anderson and Tushman, 1986; Romanlli and Tushman, 1994), multi-lens perspective (Rajagopalan and Spreitzer, 1997) and a framework for managing IT-enabled change (Benjamin and Levinson, 1993). Particularly noteworthy is the 3-stage model implementation by Watson and Mundy (2001). Ideally a new system would temporally move through the three stages of initiation, infusion and customization. However, during each stage of implementation, there are conversion barriers that may prevent the new system from successfully moving into the next stage.

In this regard, interoperability barriers within government networks have been categorized under political, organizational, economic and technical factors (Landsbergen and Wolken 2001). The lack of technical, personnel and financial capacities are perceived to be major barriers to the development of e-government in many municipalities (Moon, 2002). e-Government practices reduce time demand of staff but increases task demands on staff. Lack of resources can often diminish the potential value of the new system. However, even when these resources are available, they do not ensure that the organization will realize full potential value due to the many possible barriers.

Institutions such as the government can use intervention to influence and regulate the direction and progress of IT innovation in the industry. For example, six instruments of institutional action identified by King et al. (1994) are knowledge building, knowledge deployment, subsidy, mobilization, standard setting and innovation directive. However, there is little research in the literature that relates the possible intervention actions (that can be taken by the government) to the various barriers that may exist.

RESEARCH STUDY

Research Question

Against this backdrop, this study seeks to answer the following question:

- How can governments take appropriate change intervention actions to ensure the success of e-government implementations?

Proposed Theoretical Framework

To answer the above question, we first develop a theoretical framework by drawing upon the work of Watson and Mundy (2001), Chircu and Kauffman (2000) and Huy (2001) as in figure 1.

In the framework, based on Watson and Mundy's 3-stage model, the implementation of an e-government system would involve the three stages of initiation, infusion and customization. During each stage of implementation, there are conversion barriers that may prevent the new system from successfully moving into the next stage. These barriers can be classified into resource, knowledge and usage (Chircu and Kauffman, 2000). Resources barriers arise from scarcity when there are not enough resources in an organization to devote entirely to the project and maintain normal operations at the same time. Knowledge barriers can arise from the lack of sufficient knowledge on the new system. Usage barriers are often related to user's perception of the technology and the responsibilities when it must be used. Such conversion barriers will lower the realized value of the system. Worse, if certain barriers are not resolved it may prevent the implementation from progressing into the next phase and the project may even end in failure. To overcome such barriers, the government can use various

change intervention strategies to resolve and eliminate such barriers. Different types of strategies can be classified under the commanding, engineering, teaching and socializing change interventions identified by Huy (2001). Commanding intervention brings about change via enforcing compliance of coercive actions. Engineering approach is generally used to cause a shift from old work processes and routines to newer ones. Intervention via teaching is influencing in nature, and involves outsiders questioning and changing the mindsets of the change targets, generally by emphasizing the benefits of the new beliefs. Socializing intervention involves self-motivated individuals seeking to change behavior in an organization by changing beliefs and values. Through co-operation with various public and private organizations, the government can thus implement these change intervention strategies to eliminate these barriers that occur during each phase of adoption.

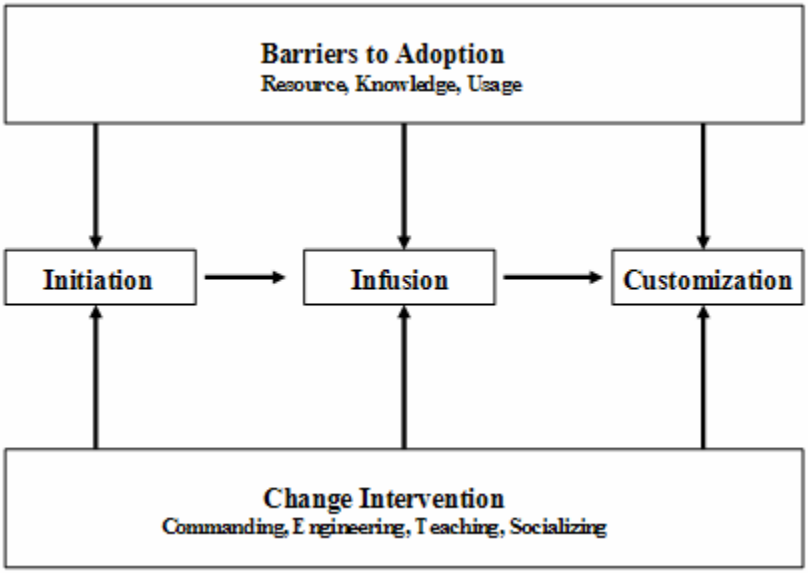

Figure 1. Proposed Preliminary Framework

During the initiation phase of a new system, the government agency involved will be generally focused on introducing it to its targets. It is often introduced as a trial run or as a new initiative without attempting to replace the old system completely at this stage. Problems or "bugs" of the system that occur will be fixed and awareness campaigns are usually low key and scale of implementation small as a deliberate decision by the initiator. If the new system proves to be a failure, the initiator can retract the new system without causing much implication. The success of the project during the initiation phase can be measured by the number of barriers it is able to overcome, like obtaining further funding after a successful trial run (overcoming a resource barrier), or having a high initial rating from the initial users (overcoming a usage barrier). After this phase is proven successful, the government agency will then persuade the various parties to adopt the new system. The initiator can use several methods of change intervention in their promotion effort. During this infusion phase, strategies include launching marketing campaigns and getting the major players of the industry to lend support to the new system. Provision of training programs and subsidies can be used to entice users to use the system. An option is to make usage of the system mandatory for the users to do transactions with the initiator. Whatever method is used, its purpose is to make the system become the main form of transaction medium in the industry or at least have a critical mass of users so that the initiator can have a reasonable value of return on investment from the system. The system enters the customization phase once it has successfully replaced the old system to become the new work norm in the industry. In this phase, users who are familiar with the system can customize it to suit their own preferences and re-engineer their work processes to derive productivity gains on a personal, corporate or industry level.

Research Site

To demonstrate the applicability of the above framework, this study focuses on CORENET, an e-government initiative promoted by the Building and Construction Authority (BCA). BCA is a statutory board in Singapore and its primary role is to develop and regulate Singapore's building and construction industry. Lead by the Ministry of National Development to build IT infrastructure to facilitate online information and services for the construction industry, CORENET aims at integrating the four processes of the building project life cycle: Design, Procure, Build and Maintain.

In 2000, a survey was done by BCA to assess the level of IT readiness in the Singapore construction industry (BCA, 2000). The results of the report indicated that the use of IT within the construction industry was fragmented and the gap within the different segments was growing. In most cases, IT spending constituted less than 10% of firms' overall expenditure. Companies were slow to adapt to the Internet. The major obstacles for firms in promoting the use of IT included "high cost and continuous upgrading", "lack of standards/coordination problems" and "justifying the large cost of IT investment to management".

Against this backdrop, the CORENET project currently online includes the e-information system and the e-submission system. The e-information system is a central repository for building and construction related information and services consolidated under a single website. Its e-catalogue provides technical and marketing information on building materials, products, labour and services and its electronic library has reusable CAD details that architects can incorporate into their drawings. e-Information services also keep its members updated with e-newsletters through its mailing list. The e-submission system allows firms to submit building plans and other related documents online to the regulatory authorities for approval. The aim of the system is to provide a single point of access for submission. Firms no longer waste time and paper costs in making multiple copies of the same document and making several trips to submit them as the various regulatory authorities need only extract the file from the central database. In the works is an automated plan-checking system where building plans will be automatically checked for structural irregularities and non-compliance of common standards, using an expert system. This can help to speed up the plan approval process for firms.

Research Methodology

The methodology used in this paper is case study research. Case study is a good way of observing a natural and unique setting where the knowledge of practitioners can be captured and studied upon (Benbasat, Goldstein and Mead, 1987). Data collection methods for case study research include retrieving data from documentation, archival records, interviews, direct observation and physical artifacts (Benbasat et al., 1987). For this study, the research effort spanned approximately 2 years which started in July 2002 and data was gathered via several different methods. Primary sources of data were gathered from interviews with various officers from BCA, staff of IT vendors, architects and employees from private companies in the construction industry as well as the Singapore Contractor's Association. In particular, CORENET project managers and the Executive Director of the Singapore Contractor's Association were interviewed to learn more about the workings of CORENET, its progress, the various incentive schemes available for firms, and the industry's reactions to the project. A preliminary interview questionnaire was developed at the start of the study and it was gradually refined over time. Interviews were first transcribed on paper, and then compared alongside one another for emerging themes. Secondary sources of information were from brochures, news articles, BCA newsletters and websites of CORENET, BCA and other government agencies.

RESEARCH FINDINGS

From Initiation to Infusion

Resource Barriers

The system was introduced at a time in which the economic outlook was unfavourable. An economic depression has followed after the bursting of the dot-com bubble and the 911 terrorist attacks. The local construction industry in Singapore was not doing well. The number of building projects, tenders and contracts had dropped following the economic downturn. The lack of new construction projects and the gloomy economic outlook affected firms' attitudes in adopting a new IT investment at this time. With the ongoing recession in the economy, contractors are unwilling to spend the extra money to invest in a new technology.

Related to the bad economic climate, many firms were unwilling to invest resources in a new system when there is a need to minimize expenditure. From the survey (BCA, 2000), the "high cost and continuous upgrading" (70.3%) is the most cited reason for companies for not investing in new IT technology. The "high cost" may be real or imagined , but this perception has a negative effect on financial spending. To some companies, IT spending is seen as a "cost" rather than an "investment".

> "*Right now, construction companies are not very willing to spend extra money. Even $50 is still expensive for them. It is a bad time for the construction industry.*" *- CORENET Project Manager, BCA*

Lack of manpower is also one of the barriers affecting the rate of adoption of CORENET. Effort and resources are needed to catalogue the entire inventory and IT experts are needed to maintain the database. Some companies are unwilling to devote these resources to the new technology when the current market situation is not good.

> *"They (contractors) don't resist for the sake of resistance. But the aligning of accounts, plans and standards setting are not being done. "* *- CORENET Project Manager, BCA*

To help firms to overcome barriers due to lack of financial support, BCA has co-operated with other government bodies to provide incentive schemes to firms in the construction industry. One such example is the Investment Allowance Scheme which subsidizes the purchase of IT hardware and software. There are also assistance schemes for employing consultants to help companies re-engineer their business processes and develop e-commerce technologies. Some incentive schemes are offered as a "time-limited" promotion to encourage early adoption.

Knowledge Barriers

From the survey (BCA, 2000), around 46.8% of the construction firms have 81-100% of their staff undergo some form of computer training. Draftsmen seem to have the highest level of computer competence. However, only 21-50% of the employees from builders and contractors are trained in IT. BCA is also aware of the huge gap in IT-competency among the construction industry.

> *"Construction industry in Singapore is well known to be the lowest IT-savvy."*
>
> *- CORENET Project Manager, BCA*

To increase the level of IT competency in the industry, BCA conducts programs to promote and train employees of various firms on how to use CORENET. BCA has collaborated with the Economic Development Board to set up a program called Initiatives in New Technology Scheme, which allows companies to reimburse up to 70% of their training grant.

CORENET can be considered to be the first of its kind in the construction industry. As such, some companies may be reluctant to join as the concept is still relatively untested. Many companies are adopting a 'wait-and-see' attitude to let the other firms sort out the teething problems before coming onboard. Other companies will only join if the system is a proven success. These factors inhibit the initial take-up rate of the project and may prevent the system from reaching critical mass. BCA has commented that governments from other countries are watching the development of CORENET closely and will consider implementing it in their own countries if CORENET proves to be a success.

Usage Barriers

To implement CORENET, a set of common IT and industrial standards needs to be decided upon as the basis for implementation. Although the system can be designed to handle multiple standards, such design will incur more costs due to increased technological complexity and is not cost-effective in the long run.

> *"Before we can go into IT proper, we need standardization. This is done by the design workgroup"*
>
> *- Director, Singapore Contractor's Association*

In order to solve this standards issue, BCA is setting CP83 as the official standard for the construction industry in the future. This can help resolve ambiguity within the industry and facilitate communication between firms. However, all factors should be considered before choosing a certain set of standards as the official standard. The chosen set of standards should be compliant to international standards and be acceptable to most organizations in the industry. In this case, CP83 seems only applicable to the construction industry in Singapore at the moment. The government can choose to work with an international standards body to work out the official standard to endorse. For CORENET, BCA has set up the Construction Industry IT Standards Technical Committee, which is working with SPRING Singapore (a government agency for standards) and international standards bodies like the IAI (International Alliance for Interoperability) to establish common standards for the construction industry in Singapore. For those companies who are having problems achieving the CP83 standard, BCA helps them through subsidized software and incentive schemes.

During the initiation phase, most potential users will be unaware of the new system and its benefits. Thus, the main emphasis is to create awareness for the new system. BCA creates awareness for CORENET through various advertising channels such as newsletters, circulars, newspapers, etc. BCA conducts seminars and participates in conferences and exhibitions to promote CORENET. BCA sends monthly newsletters to the construction companies to keep them informed of the latest happenings of CORENET and the construction industry. From the survey (BCA, 2000), 50.8% of the companies keep themselves updated of CORENET through these newsletters. BCA also collaborates with government agencies to send promotional faxes under that agency's letterhead. In that way, BCA wishes to emphasize that CORENET is a project that is backed by all relevant partners and not just BCA.

> *"It is highly publicized, there are seminars on it (you'll have to pay to attend), circulars from professional institutes e.g. From Singapore Institute of Architects, newsletters (from professional bodies)"*
>
> *- Architect, User of CORENET e-submission system*

From Infusion to Customization

Resource Barriers

A broadband internet connection is needed for e-submission as file sizes of building plans are large. However, although a broadband infrastructure is already in place within Singapore and broadband services are available to local businesses, a lot of construction companies in Singapore have not engaged broadband access. Many architectural and construction firms are small to medium enterprises which are still using a 56K modems in their office to access the internet. BCA acknowledged that firms' slow adoption of broadband services is one of the major barriers that they face in convincing companies to convert to CORENET. As the government considers a broadband connection to be an operating cost of companies, it is not subsidized.

If the users cannot adapt to the system, the system will have to adapt to the users. BCA tries to provide a workaround solution for those companies without a broadband connection in their office. BCA set up internet kiosks at various statutory boards to let such firms gain access to CORENET. Firms can copy the documents to a CDRW and upload them electronically using the internet kiosks. However, the effectiveness of the internet kiosks may be limited since it limits some of the benefits that electronic submission that is supposed to bring in the first place, like submission of plans anytime, anywhere through the internet.

Knowledge Barriers

As BCA is pushing CORENET towards industry wide implementation, more companies will need to learn to use the system. This will require more comprehensive training programs to cater to the different needs of different users in the industry. For example, whereas the training for an architect will concentrate more on the e-submission of plans, the training for a builder will likely to be on construction standards and e-procurement.

Another problem that surfaced actually lies with lack of knowledge with the regulatory bodies themselves regarding CORENET. Apparently some statutory boards were unfamiliar with how to use CORENET themselves.

> *"There is a complete lack of knowledge of the people at the regulatory bodies' side. When you asked them questions they would say things like 'We're still new' and 'We're not sure about it'. It's very frustrating"*
>
> *- Architect 1, User of CORENET e-submission system*

> *"Officers from various technical departments are not familiar with the system. We have received clearances from technical departments without ref. no., date, site info…*
>
> *- Architect 2, User of CORENET e-submission system*

This lack of knowledge shows a serious problem in the understanding of the workings of CORENET in both private and public organisations although this barrier should have been discovered and resolved during the initiation phase. Relevant teaching and training for the governmental agencies during the initiation phase may be able to prevent this problem from appearing in this phase.

Usage Barriers

In inter-organizational systems a minimum number of users is required to achieve a return on investment. This critical mass is also needed before the system can take off and achieve widespread adoption by itself.

BCA tries to overcome this barrier by setting deadlines to make it mandatory for all firms to use the e-submission system as the only form of submission for building plans for government tenders in July 2002. However, this hard measure is softened with an option of plea for waiver on a case-by-case basis. By July 2004, all public and private building plans have to be submitted electronically via CORENET. Firms have mixed sentiment about this rule.

> *"It's a chicken and egg problem. If it's not compulsory, no one would bother to use it. But if it's compulsory, there are people who would complain."* *- Architect, User of CORENET e-submission system*

DISCUSSION

Further to the above findings, we classify and categorize in detail the interactions and relationships between barriers and change intervention actions during each phase of the CORENET implementation, as per Table 1.

As mentioned earlier, a survey was done by BCA in 2000 to assess the level of IT readiness in the Singapore construction industry (BCA, 2000). It is clear from our research findings that in response to the survey, BCA has adopted a portfolio of change intervention actions to help construction companies become IT-enabled in order to encourage more rapid adoption for CORNET, and enlist the support of industry stalwarts to drive the need for quick implementation and provide the necessary know-how. In this regard, BCA has gathered the support of the various governmental bodies such as the Housing and Development Board, Land Transport Authority and other statutory boards to use the e-submission system as the main standard of submitting architectural plans for government tenders. BCA has also worked with associations such as Singapore Institute of Architects and Singapore Contractor's Association to endorse their commitment to CORENET. That has a bit of success in pushing the e-submission system as the main form of communication for architectural plans. Overall, resource and knowledge barriers were found to be significant from the initiation to the infusion stages with knowledge barrier continued beyond the infusion stage. On the other hand, as expected, usage barriers did not come into the picture until the infusion stage. For the corresponding intervention strategies, commanding and socializing seemed to be less important after the infusion stage. We thus refine our proposed preliminary framework as per Figure 2.

Resource	Economic conditions Lack of financial support Lack of manpower Lack of complementary technology Changing technological formats	Lack of financial resources Lack of client infrastructure Legacy systems		**Barriers**
Knowledge	IT competency Integrity of data Technological complexity Pioneer status	Different knowledge requirements of users Limited technical knowledge	Lack of knowledge to effectively use the new system	
Usage		User acceptance Critical mass	Lack of continuous improvement Level of customization available	
	Initiation →	**Infusion** →	**Customization**	
Commanding	Setting up legal procedures Promotion of common standards	Mandatory policy Deadlines for adoption		**Change Interventions**
Engineering	Electronic signature Card readers for secure transactions Standard compliance designed software Use of open standards	Integration of system into the main business processes Provision of alternatives in using the system	Re-engineering of business processes Improving & customizing system	
Teaching	Training programs Seminars User support	Training programs User support	Teaching of best practices to the industry	
Socializing	Getting support of key players Awareness through publicity Incentive schemes	Attracting more influential market users Media coverage Incentive schemes		

Table 1. Summary of Findings

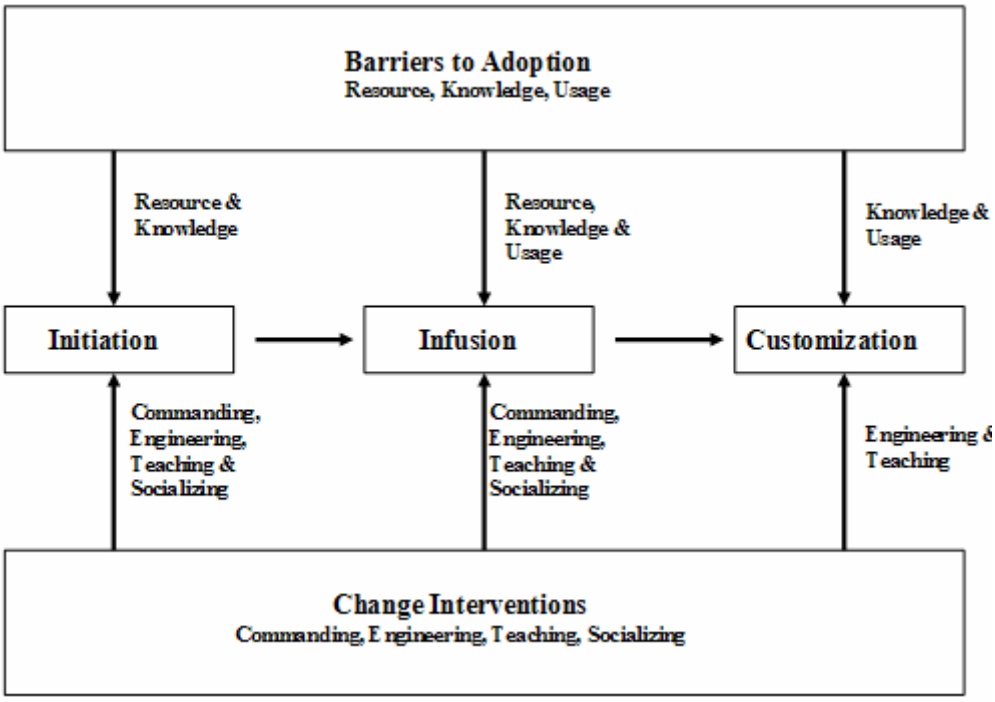

Figure 2 Revised Framework

CONCLUSION

In this paper, we have identified the interrelationship between the various barriers to adoption of e-government systems and the corresponding change interventions that could be used to eliminate such barriers based on a three-stage approach (Watson and Mundy, 2001).

In this regard, it may be interesting to explore if some of the barriers identified, such as knowledge, during our study equally apply to other settings. Moreover, the current list of identified barriers and change intervention strategies may not be exhaustive. Other potential barriers may exist and the corresponding change intervention strategies can be further explored.

Initiatives with strong leadership such as that shown by BCA in CORENET are crucial in the various stages of implementation. Co-operation and joint promotion by other government agencies as well as other related firms is vital instead of leaving it to the initiator alone. Based on our study, commanding intervention may be able to resolve usage barriers such as lack of common standards. However, in the international market, even the government will be unable to exert such tactics and thus it will not be effective in situations where the initiator has relatively weak market power. Moreover, for the customization stage, commanding intervention seems to have no role to play. Engineering intervention seems to be able to help from initiation to infusion and all the way to customization. However, extra costs are required and/or limits to the functionalities cannot be overlooked as evidenced in our case study.

On the other hand, teaching and socializing interventions do not seem to have significant impact on resource barriers. As such, training courses, seminars and hands on sessions should aim for the increase of users' knowledge and their inclination to use the system. Good user support makes them more confident in using the system and best practices in the industry should be shared. Collaborating with the bigger players in the industry can help to encourage smaller firms.

Finally, this study demonstrates that government initiated interventions, with a favourable infrastructure, financial and other incentives as well as the necessary training and knowledge may not be sufficient to overcome the various barriers at the different stages of implementation. Complementary technologies, standards as well as strategies in coordinating with key players are also vital. A limitation of this study is that it is conducted in just one country – Singapore – where government authorities are well known to have strong institutional authority and where governmental interventions in many sectors of the economy and in society at large are generally accepted. In this regard, it is important to note that government bodies in other countries may hold different interpretations, priorities, values and cultures, which would greatly influence the strategies created and implemented by policy makers. For example, commanding intervention seems to be particularly prominent in

the context of our Singapore study. Interested researchers may therefore wish to explore these same concepts in other settings.

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REFERENCES

1. Anderson P. and Tushman M. L. (1986) Technological Discontinuities and Organizational Environments. *Administrative Science Quarterly*, 31, 439-465
2. BCA (2000) IT Landscape of Construction Industry, Singapore : A Summary Report. Available at http://www.corenet.gov.sg/Corenet/e_newsroom/issue1_201101/it_landscape/it_landscape_svy2001.html, accessed Jan 2005.
3. Benbasat I., Goldstein D. K. and Mead M. (1987) The Case Research Strategy in Studies of Information Systems, *MIS Quarterly*, 11(3), 368-386.
4. Benjamin R. I. and Levinson E. (1993) A Framework for Managing IT-Enabled Change. *Sloan Management Review*, 34(4), 23-33.
5. Chircu M. A. and Kauffman J. R. (2000) Limits to Value in Electronic Commerce-Related IT Investments. *Journal of Management Information Systems*, 17(2), 59-80.
6. Grönlund Å. (2001) Democracy in an IT-framed Society: Introduction. *Communications of the ACM* 44(1), 22-26.
7. Huy, Q. N. (2001) Time, Temporal Capability, and Planned Change. *Academy of Management Review*, 26(4), 601-623.
8. Kambil A. and van Heck E. (1998) Reengineering the Dutch Flower Auctions: A Framework for Analyzing Exchange Organizations. *Information Systems Research*, 9(1), 1-19.
9. King J. L, Gurbaxani V, Kraener K. L, McFarlan W. F, Raman K. S. and Yap C. S. (1994) Institutional Factors in Information Technology Innovation. *Information Systems Research* 5(2), 139-169.
10. Landsbergen D. Jr. and Wolken G. Jr. (2001) Realizing the Promise: Government Information systems and the Fourth Generation of Information Technology. *Public Administration Review*, Washington, 61(2), 206-218.
11. Lee H.G. and Clark T. H. (1996-97) Market Process Re-engineering through Electronic Market Systems: Opportunities and Challenges. *Journal of Management Information Systems*, 13(3), 113-136.
12. Moon M. J. (2002) The Evolution of E-government among Municipalities: Rhetoric or Reality? *Public Administration Review*, Washington, 62(4), 424-433.
13. Orlikowski W. J. (1996) Improvising Organizational Transformation Over Time: A Situated Change Perspective. *Information Systems Research*, 7(1), 63-92.
14. Rajagopalan N. and Spreitzer G. M. (1997) Towards a Theory of Strategic Change: A Multi-lens Perspective and Integrative Framework. *Academy of Management Review*, 22 (1), 48-79.
15. Romanelli E. and Tushman M. L. (1994) Organizational Equilibrium as Punctuated Equilibrium: An Empirical Test. *Academy of Management Journal*, 37(5), 1141-1188.
16. Sprecher, M. (2000) Racing to E-government: Using the Internet for Citizen Service Delivery. *Government Finance Review.*16(5), 21-22.
17. Watson R. T. and Mundy B. (2001) A Strategic Perspective of Electronic Democracy. *Communications of the ACM*, 44(1), 27-30.