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E-Government IT Investment: Insights from a Lens Model

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Abstract

E-government presents great opportunities for governments around the globe to reform their public services. Yet, it can potentially risk wasting resources by failing to deliver promises of improved services and further frustrating the general public with government. In order to make correct decision in IT investment, governments have to find appropriate entry points to execute their business strategy; and the appropriate processes to select and implement suitable IT projects within realistic time and budget. This paper used a lens model approach to first devise a framework for examining the effects of entry points on the organizational scanning processes in support of formulating the right IT strategies and creating a realistic outlook of IT investment; and then to apply the framework for analyzing three cases. The findings indicate that entry points which only emphasized quick deployment of IT were mostly likely to limit the needed scanning processes, and resulted in project overruns. Whereas entry points which emphasized on internal capacity building for learning and knowledge transfer, and/or creation of an enabling environment for strategic partnership were mostly likely to intensify the scanning processes which further enhanced the chances of success for IT investment.

Keywords: Lens Model, Entry Points, Scanning

In the Western European public sector, there seems to be two distinctive phases of e-government development. The first phase roughly covering the period 1999-2003 has been concentrated on developing portal front-end solutions for meeting countries' electronic service delivery targets; and the second phase covering the period 2003-08 on modernizing and joining up back-office operations. The reasons for the chronology include: that front-end solutions present a logical view as services are the public face of government; that they underline the primary objective of e-government in forging a closer link with citizen users by providing an efficient alternative to interact with the service providers; and that they demand less resource than the task of joining up back-office systems and operations to achieve operational and functional organizational integration (Barki and Pinsonneault, 2003).

The first phase fuelled much by the market push of racing to become a world-class e-commerce hub has been criticized as no more than a rush mentality of embracing new technologies despite the technological and organizational unreadiness of most governments (Booz Allen Hamilton, 2002). It has also contested the acclaim that ICT led economic growth can raise national productivity, and increase social inclusion and individual wealth. Yet in reality, the gaps between the rich and the poor are only widening¹, and the uptake of online services has been dismal. This has raised serious questions of whether governments have deployed the incorrect strategy or whether they have entered the strategy incorrectly.

The first phase bears all the hallmarks of bandwagon. First, contrary to the assumption that there is a mass demand for online services, many people in the Western world have expressed little or no interest in Internet access (Kuk, 2003). For example, a major setback for the UK online strategy has been the lack of uptake by its targeted users, specifically the socially disadvantaged groups that are

¹ The existing evidence suggests that income, education and age are important social determinants of Internet access. In the UK, the current figures indicate that only one in ten of the elderly and one in six of the poorest families have access to the Internet, and the gap in the household access between the lowest and the highest income groups is widening and increasing from 69 (2001-2002) to 74 percent (2002-2003).

traditionally heavy users of public services. So the rationale suggesting that IT investment would eventually allow for substantial savings through the scale back of a more costly physical channel and the reallocation of resources to other areas of public services has turned out to be unjustified. Second, the association of e-government with the slogan of making democratic elected governments more accountable has generated enormous social pressure for all democratic governments to follow suit. Third, no governments can afford to be laggards as their online performance is constantly under scrutiny and subject to numerous international audits and benchmarking exercises by bodies such as the United Nations, European Commission, and large consultancy firms.

Bandwagons have been described as diffusion processes whereby individuals or organizations adopt an idea, technique, technology, or product because of pressures caused by the number of organizations that have already adopted it (Abrahamson and Rosenkopf, 1990). Unlike most commercial organizations, the e-government initiative has presented governments with little options of opting out and is part of an inevitable process of public sector reforms to replace the ailing off the counter services with a more cost-effective electronic channel. However, the “if we build it, they will come” mentality would be a very costly strategy to pursue in the second phase of e-government development. How governments rise to the modernization agenda demands scholarly inquiries on several important issues: What are the entry points to the development and implementation of e-government? Can governments do things differently? For example, can they defy the front-end logic and embark first on the back-office integration? Can governments avert from simply yielding to the bandwagon pressure but revert the call for e-government into opportunities for learning and process re-engineering? In addressing these questions, our specific focus is on the factors that drive the development of sound IT strategies, and the processes that support adequate IT investment decision and effective IT implementation.

There is void in research of how to execute business strategies through processes and technologies. Most of the literature seems to concentrate on theorizing the alignment between business and IT strategies than providing the tools and processes for translating the business strategies into actionable IT strategic goals (Henderson and Venkatraman, 1993; Luftman and Brier, 1999; Sabberwal, Hirschheim and Goles, 2001). This paper argues that business strategies must consider entry points and their impacts. Entry points underline the strategic goals and direction relating to the possible IT strategies to adopt and the subsequent order of execution and implementation activities to take. In this paper, we adopt a lens model to examine the following broad question: what are the effects of different entry points on the organizational scanning capabilities in support of choosing sound IT strategies and creating a realistic outlook of IT investment and implementation?

The rest of the paper is organized as follows. We adopt a lens approach to provide a general framework to study the processes underpinned IT strategy development and investment decision, and then extend the framework to examine three cases of e-government related IT investments as explained in the research methodology. We then present the analysis of each case and draw some conclusions from them. Finally, the paper’s limitations, findings and implications are discussed.

1 Theoretical Development

Failed projects and poor returns are the two most insidious problems in IT investment. The attributed factors are intriguingly interconnected and embedded within and beyond an organization’s boundary (Chircu and Kauffman, 2000). They range from strategic misfits such as misalignment between business and IT strategy (Sabberwal and Chan, 2001) to implementation problems such as poor initial project scoping with unrealistic cost and schedule (Christensen and Thayer, 2001; Dillon, John and von Winterfeldt, 2002). Against the complex relations among all the key internal and external factors, organizations have to find the appropriate entry points to execute their business strategy; and the appropriate processes to select suitable IT projects and implement IT projects within realistic time and budget. The basic premise of this paper is that incorrect entry points will limit the organizational capability in the processes to take when it comes to scan and interpret information for formulating sound IT strategies and making the right IT investment decision.

The scanning literature suggests that the entry points of most organizations tend to be more externally than internally focused, and this in turn predisposes organizations to scan more the external than the

internal environment. The external orientation underlines two specific premises of the logic of scarcity: first, because of their scarcity of time and resources (Garg, Walters and Priem, 2003), organization executives have to be selective in what and where they scan, and with the linkage between expanded boundary spanning and increased organizational performance (Geletkanycz and Hambrick, 1997), their main task is one of gathering business intelligence from the external environment; and second, external sources of knowledge and information are scarce and more difficult to access than internal sources, executives tend to value external knowledge more (Menon and Pfeffer, 2003), and as a result of their escalated effort in environmental scanning, they are more committed to external sources (Thomas, Clark and Gioia, 1993).

The scarcity logic has made a whole series of assumptions that need to be scrutinized. First, it is logical for the first entry point to tackle external rather than internal focused elements of a business strategy. Second, it is assumed that executives have an intimate understanding of their organizational capabilities and knowledge resources, and that they have undergone painstaking processes of analysing what organizations need, and carefully matched their internal capabilities with external threat and opportunities. Third, internal structures and processes are in place and adequate to support executives in realigning and reconfiguring their internal resources assuming that resources can be easily mobilized and utilized for timely deployment. And lastly, executives have the requisite knowledge to acquire and use information during and after scanning. This paper seeks to examine some of these assumptions by using a different empirical lens to add new insights to the current literature.

Similar to most models evoked to study IT investment decision, the aforementioned assumptions revolve around executives' abilities in making the right choice, and continue with the organizational capabilities in executing the solution within budget and schedule (Chircu and Kauffman, 2000; Markus and Keil, 1994; Tripsas and Gavetti, 2000). These abilities underlie the organizational "knowing" capabilities that are essential to address fundamental questions of what an organization knows regarding what IT to invest, and how it comes to know about it, and what and how IT blends into the business strategies and value-chain activities (Armstrong and Sambamurthy, 1999; Tippins and Sohi, 2003). Knowing is generally regarded as an intentional action that an organization takes to scan the internal and external environments for information to use in meaning construction and reality interpretation. Cook and Brown (Cook and Brown, 1999, p. 388) use productive inquiry to situate knowing as "that aspect of activity where we are deliberately (though not consciously) seeking what we need, in order to do what we want to do."

The intentional and deliberate aspect of scanning aims to conserve the executives' scarce physical and cognitive resources, and to focus their attention and effort on information sources that are critical to their business, and ultimately results in better organization performance than a random, haphazard scanning (Garg, Walters and Priem, 2003). However, the flip side of a focused but limited scanning runs the risk of committing a range of decisional biases which not only make organizations susceptible to social pressure but also reduce the level of alertness that executives need to avoid any bandwagon decisions. In the face of bandwagon, Fiol and O'Conner (2003) suggest that high state of alertness or mindfulness allow decision makers to pursue their own strategy by resisting bandwagon pressure of implementing generally accepted solutions. Mindfulness behaviours include increased alertness to any new developments, creation of new knowledge categories for sense making, and continuous scanning for information that is directly relevant to one's unique situation. This paper uses a lens model to further contextualize these scanning activities underpinning IT investment decision, and aims to advance four specific arguments. First, the scanning for IT investment decision involves a dual and interdependent process of searching and verifying information from both the internal and external sources. Second, the joint scanning activities rely on key informants not only to gather but also to integrate the less than ideal information, which is likely to be fragmented and incomplete from highly dispersed sources within and beyond an organization's boundary. Third, the wider and the closer are the scanning activities to where the IT will be finally implemented, the lesser the problem in the IT implementation and the better the process in harnessing IT values from the investment. And

finally, the way the organization enters a business strategy can expand the scanning processes and increase the chances of success in IT investment.

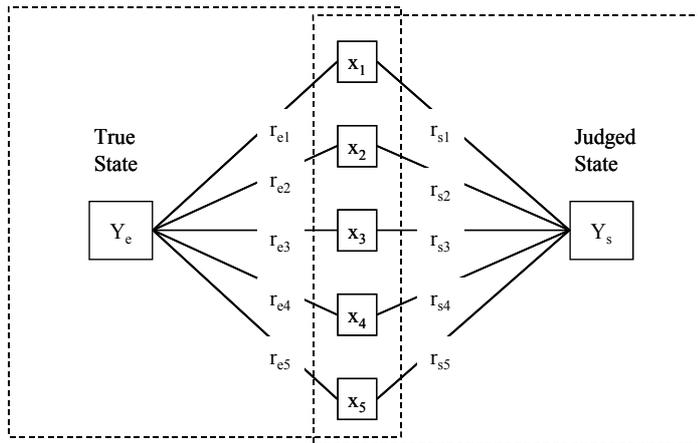


Figure 1: Lens model

2 Lens model

Brunswik first proposed the lens model in the 1940s and 1950s (Brunswik, 1952). Since then the model has been widely adopted to provide a theoretical account of expert and team decision-making (e.g. Hollenbeck et al., 1995; Kim and McLeod, 1999). The model proposes that decision is made based on the evaluation of a finite set of cues. The accuracy of the decision is based on how close the final decision is to the true relationship between cues and the decision criterion. In Figure 1, the left hand region represents the true “cue-to-criterion” functional relationship whereas the right hand side represents the decision maker’s best estimation. The decision accuracy (expressed by the correlation between Y_e and Y_s and called “achievement” by Brunswik) depends on whether the right set of cues are included and subsequently utilized in decision-making. Hence, the initial scanning has to be exhaustive and only retains the set of cues that are highly predictive of the true state. The underlying process relies heavily on the decision maker’s judgement of the ecological validity of each cue (x_1 through x_5) and assigns weight (r_{s1} through r_{s5}) to each cue accordingly. Here we further extend the lens model to reflect the fact that IT investment presents a complex decision problem and is likely to drive organizations to relying on multiple informants and information sources to inform their decision.

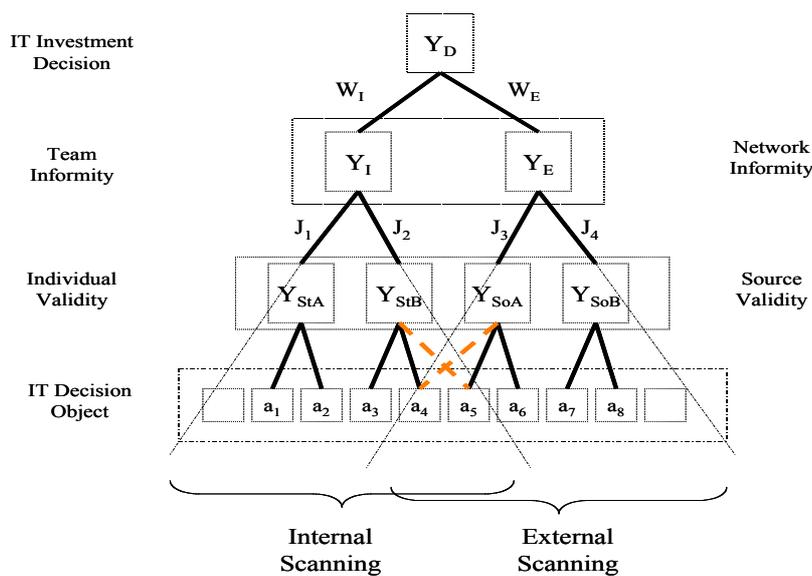


Figure 2: IT investment scanning activities, informity and validity

Figure 2 depicts a theoretical framework related to scanning activities of both internal and external information sources that are distributed within and beyond a firm's boundary. Internal scanning covers the information flow based on the inputs and outputs at various levels. Starting from the bottom, all attributes of an IT decision object (i.e. a particular IT that a firm is considering to invest) are subject to scanning but not all of them will be selected. The selection and evaluation depends on the informant's distance to the decision object. It is generally accepted that the closer the informants are to the object, the better is the judgement (Hollenbeck et al., 1995; von Hippel, 1994). Attributes that are highly salient to the informants are most likely to be selected, evaluated and passed on to the next level where all evaluation is subject to further screening and evaluation.

At the second level, an IT project team is most likely to be in place to make further refinement and final recommendation based on the validity of each individual source of information. The inclusion has to be exhaustive in the first instance, and the decision makers have to weigh each source accordingly to the validity of each individual informant. The final set of cues represents the overall informity of the team (a_1 to a_2 via Y_{StA} and a_3 to a_4 via Y_{StB}), and the assigned weights (J_1 and J_2) represent the relative validities of individual informants. However, firms might be reluctant to rely on internal informants. First, informants generally perceive technology as a threat, and that new technology will only make their jobs redundant (Pinsonneault and Kraemer, 1997). Second, the informants are less likely to have the intimate knowledge of the latest technology. Third, the extra effort and resources required to overcome the inherent barriers presented in crossing occupational communities in information and knowledge transfer (Bechky, 2003) has further discouraged the use of informants. Markus and Keil (1994) suggest that nevertheless informants are key to overcome the implementation and uptake barriers for any successful IT rollout.

External scanning on the other hand focuses on the utilization of the firm executives' formal and informal networks, external sources of information including industrial analyses and market research, and shareholders' views. These diverse sources serve to increase the network informity (a_5 to a_6 via Y_{SoA} and a_7 to a_8 via Y_{SoB}) of the final decision and the source validity depends on how close the source is to the centre of each network. It is generally accepted that the higher the network centrality, the more valid and useful is the information (Tsai 1999), and the higher is the weight (J_3 and J_4) subsequently assigned to the source. External scanning also overlaps with internal scanning when a particular set of attributes of the IT decision objects calls for a highly coupled process of information compilation from both internal and external sources to support comparison, matching and validation. Specifically issues related to systems integration and customerization place a heavy demand on the information flow between internal informants and external IT vendors. Allen (1971) asserts that the internal informants should include the technical gatekeepers not only because they have the technical expertise but also because they are most likely to have prior experiences in integrating external information for internal consumption. Their involvement will greatly enhance knowledge and information transfer.

Lastly, the final IT investment decision is based on the combined team and network informity, and their respective weights (W_I and W_E). The weight allocation reflects the strategic role of IT investment to the overall business strategy (Sabherwal and Chan, 2001). In relation to the first phase of e-government, as most Western European governments have taken the visionary stance, a much higher weight is given to the results of external scanning even though the results of internal scanning were not in favour of IT adoption (SOITM 2001). As the case studies will later show, it is rarely the case that governments exhaust all the entry points to cover both the internal and external environment, and give equal weightings to the results of internal and external scanning activities.

Taken together, this paper draws upon the present framework to examine the entry points and the scanning activities from concept to rollout of three different cases of e-government related IT investments. Our aims are threefold: first, to examine the impact of entry points on the scanning activities including loci, scope and order; second, to identify the factors that enhance (or dampen) scanning; and third, to relate the effect of scanning on the choice of IT strategies and the outcomes of IT investment.

We have made several observations. First, to formulate the right IT strategies and investment, governments have to dedicate specialized resources and structures to intensify internal and external scanning in both information acquisition and use. Second, as the requisite knowledge and key informants for scanning and interpretation can be highly diffused within an organization's hierarchy, entry points that exploit the pre-existing networks enable timely deployment and mobilization of resources to respond positively to e-government call. Third, joint internal and external scanning in the areas of where IT is implemented allows the creation of new knowledge and work routines, which further enhance the organizational performance. Fourth, incorrect entry points not only limit the loci, scope and order scope of scanning but also contribute to failed IT projects and overruns.

3 Research Methodology

To explore the nature of scanning activities and their relationship with e-government IT rollout, we conducted comparative case studies. Due to the lack of prior research on scanning activities of IT investment in the public sector, the desire to understand scanning activities within rich organizational contexts and the sensitive nature of the data needed, we gathered data primarily through semistructured, on-site interviews. Following the recommendation of Eisenhardt (1989), we used a theoretical sampling approach to guide our case selection and to refine our research questions. With an emphasis on cross-case diversity, we conducted three case studies including one non-Western European central government, and three Western European local governments. The choice was made based on the uniqueness that each case could offer to enrich our understanding of the challenges encountered in front-end and back-office integration. We use the pseudonyms NEW_CENTRAL, LIFE_LOCAL and PROCURE_LOCAL to represent the three cases.

In the period 1997-2003, in contrast to most Western counterparts, NEW_CENTRAL was tackling with back-office integration as part of the public sector modernization agenda and only rolled out its online portal in 2004. For the other three cases, LIFE_LOCAL started with a local e-government project in developing an IS for dealing with front-end issues related to bereavement (2001-2003); and PROCURE_LOCAL was tackling a regional initiative in developing an e-tendering IS for integrating the internal procurement processes (2001-2003).

Data collection and analysis. Each case involved a retrospective, in-depth examination of the management account of the IT/IS investment strategy and decision processes from "concept to IT/IS rollout". In an attempt to address the potential limitations of retrospective interviews, we also sought interviews from multiple informants including CEO, CIO and project manager whenever it was possible. The interview questions were nondirective. Interviewees were first given some general themes prior to the onsite visit. The themes generally followed three lines of questioning: first, how they came about to be involved in a specific e-government IT/IS development initiative; second, what and how they knew what IT/IS to invest; and third, what lessons they had learned and how they would do it differently if they could start all over again. With NEW_CENTRAL, it took us six months to secure an interview, which finally took place in May 2003. The informant was the deputy director general of the ICT agency within the Prime Minister's department, and had been with NEW_CENTRAL for over 16 years. As part of NEW_CENTRAL policy, no recording was permitted, and after the interview, notes were compared between two researchers. With LIFE_LOCAL, two visits were made, first in November 2003 and second in August 2004. In the first visit, we interviewed the CEO, the project/technical manager and the IS manager, and then followed by an onsite study involved observing the way that the new IS was being used to support workflow and discussing with various end-users related to the impact of the new IS on work routines and staff interactions. In the second visit, the IS developer was also present at the interview, and followed by another demo and onsite study. With PROCURE_LOCAL, onsite visits and interviews were also conducted with the information manager and the e-commerce officer in August 2004. All interviews apart from the first case were tape-recorded and transcribed and all the informants were involved in the IT investment strategy and decision from concept to rollout. A total of 24 hours of interviews were conducted. Like most firms in the private sector, governments were particularly reluctant to be interviewed; and most informants did not welcome follow-up interviews and repeated onsite visits and preferred a long interview session (between 2 to 3 hours) instead. Hence, in addition to semi-

structured, onsite interviews, we also collected data from multiple sources including follow-up phone interviews, publicly available documentations, usage statistics, complaint logs and internal documents such as memos, news bulletins, customer satisfaction surveys and consultancy reports.

In terms of data analysis, the interview transcripts and notes underwent several rounds of coding and thematic analysis to refine our theoretical framework. Comparative methods were also used to identify any commonalities, differences, and gaps across cases. Other information sources including public and internal documents were analysed: to confirm any factual claims; to assess any strategic misalignment; to map out the structures of any decision and organization hierarchy; to identify the composition of the IT/IS project team; and to finally gauge any implementation overruns and the success of IT/IS rollout.

4 Descriptions of Cases

4.1 Case Study 1: NEW_CENTRAL

In 1996, NEW_CENTRAL introduced e-government as part of its modernization agenda of introducing administrative reforms to upgrade the quality, efficiency and effectiveness of public services. The work then begun in 1997 and was carried out by the ICT agency within the PM's department. The director general of the ICT agency was the chief secretary to NEW_CENTRAL and acted as the secretariat for all the committees that considered and monitored all the administrative reform initiatives including the committee on the selection and appointment of consultants. Entrusted with the task of planning and coordinating the implementation of e-government, the ICT agency provided a range of advisory and consultancy services from change and project management to technical support for all NEW_CENTRAL agencies. In the period 1997-98, five (1 front-end and 4 back-office) applications were selected for implementation on a pilot basis, and in the period of 1999-2000, two more back-office applications were added. The front-end application was used to collect revenues including tax, traffic fines and utility bills. The back-office applications were used for internal operational and functional integrations. For each application, a lead agency was identified to work alongside with the ICT agency. These lead agencies included ministry of finance, PM's office, and departments of transport, public service, human resources and justice. The rollout of all apart from the application of the justice department was completed in 2003.

In vetting external management consultants, the ICT agency adopted the methodology of the concept request for proposal (CRFP). The adoption underlined the agency's view that traditional bidding process with fixed targets and deliverables was too restrictive, and that CRFP offered a better approach by allowing the bidders to produce innovative and creative solutions. In the first stage of CRFP, the technical and implementation details were kept to a minimum; the bidders provided a conceptual model detailing what business capabilities and benefits could be achieved through their solutions. At this stage, the main evaluation criterion was whether the proposals complied with instructions and mandatory requirements as specified in the open tender. Bidders that passed the compliance criterion were then invited to the second stage where high level architecture and deliverables were submitted. Four major evaluation criteria applied at this stage: attractiveness of the solution, calibre of the solution provider, attractiveness of the technology transfer model, and current involvement in other major NEW_CENTRAL ICT initiatives. A dedicated cross-functional IS team was assembled to evaluate the functional, technical, financial and legal aspects of each submission. The evaluation results were then considered at the tender board where approval of the final bidder was made. In the last stage, a negotiation team was formed to carry out multi-track negotiations with the bidder where the detailed technical requirements, and terms and conditions were finalized and the contract was signed off.

Analysis. The CRFP started with the external scanning for the best of breed solutions. The detailed submission defined the scope for the IS team scanning activities which involved research, and discussions and deliberations with external advisory bodies and inter-governmental agencies. The final stage co-opted the final bidder with the lead agency in a detailed internal scanning. The first stage emphasized on increasing network informity, the second stage on increasing source validity by

harnessing team informity and individual validity of the IS team, and the final stage on increasing both source and individual validity, and implementability of the final solution. Because there was no set template for each submission, the IS evaluation was particularly arduous at the very start. The first pilot (a back-office application for the human resources department) took nearly 2 years to roll out. The first 18 months devoted entirely to CRFP, and at the end due to contractual disagreement, the final bidder was dropped, and another company was used instead to develop the solution. The first pilot was extremely time-consuming and there was an overrun of time by almost 50%. Nevertheless, it afforded learning opportunities for experimentation and failures. Subsequent pilots were successfully completed on time. As the IS teams continued to play a significant part in CRFP, staff were regularly sent to attend external workshops and seminars as a way of increasing their overall absorptive capacity. Finally, because the contract was only issued in stage 3, CRFP allowed NEW_CENTRAL to pass most of the risk to the bidders.

Conclusion. There was no sign of bandwagon. E-government presented NEW_CENTRAL an opportunity mainly for back-office integrations, which further enabled the front-end solution to deliver seamless services. The ICT agency performed the pivotal role as the information and knowledge broker, and used CRFP as a scanning mechanism to inform IT investment decision.

4.2 Case Study 2: LIFE_LOCAL.

In April 2001, LIFE_LOCAL opened its bereavement centre in response to the suggestion made at the local old people's forum. The centre aimed to provide support services to the bereaved by providing a one-stop shop to address all administrative issues following a death. The centre exploited the pre-existing network of LIFE_LOCAL strategic partners established since 1999 to secure their commitment to the project. A very detailed process analysis was mapped out to pinpoint the workflow and the interdependent relationships among the partners, and it served to identify other potential partners. The major partners included the registrars of birth and death, work and pension department, tax office, driver and vehicle licensing agency, probate, hospitals and hospices, and other major NGOs. LIFE_LOCAL also had a framework agreement with three major technical partners aiming to plug any knowledge and skills gaps of the in-house ICT specialists.

In the period 2001-02, the centre received a total grant of over 3.9 million Euros to invest in infrastructure. The investment followed the national ICT strategy of building capacities for e-government and other initiatives including e-commerce and e-learning. During this period, the centre was also preparing another major bid to the central government for further funding to electronically enable the existing off the counter bereavement service. Three specific functional features were considered to be included in the front-end: developing a video linkup, making the bereavement service available online 24x7 and notifying death electronically to all the relevant service groups. The first feature was championed by one of the technical partners, the second was in response to the central government push of providing all the off the counter services online by 2005, and the last one was regarded by all the partners as a logical step of improving the existing bereavement service. Before committing to the details of the final bid, the centre sent out a round of questionnaires to the public. But the response was low. This had prompted follow-up interviews and consultation with the public who had previously used the bereavement service. The results suggested that the public would like to "a one-on-one talk to a bereavement advisor than talking to someone else via a screen." So the video linkup idea was dropped. In the final bid, the centre made a specific case that mediated electronic access (where the advisor has access to electronic systems and can obtain information or complete transactions on behalf of citizens) was still the most preferred option and was most likely to benefit all the social groups without risking further social exclusion. The bid amounted to 0.28 million Euros were granted by the central government.

Analysis. In 1998, LIFE_LOCAL published its corporate ICT strategy addressing the need to share information across the organization and with partners through the use of ICT. One year later, the central government push for electronic service delivery not only aligned with its ICT strategy but also provided LIFE_LOCAL with an extra leverage in re-engineering and improving the business processes of the existing model of service delivery. The strategic partnership arrangement had

increased the scanning capability of LIFE_LOCAL through its enhanced network informity and source validity. The continual endeavor and the unrelentless effort to work with local people in developing proposals helped to minimize the risk and importantly to fan off unrealistic requests from the technical partners. The presence of in-house specialists allowed an effective co-sourcing arrangement with the technical partners to supplement in-house specialist knowledge and skills, and to increase effective internal scanning, team informity and individual validity. Overall, the bereavement project was a success. The development of the front-end including the electronic notification system was in place in June 2002, and the uptake remained high with 74% adoption rate in the period 2002-2003. The front-end mediated services had resulted in substantive changes in the way the back office operated. At the beginning, there were 2 members of staff working full time and 1 part time, now there were 6 working full time. Previously, staff from other agencies was booked to come in on an "as needed" basis. Now one staff was permanently seconded from the work and pension department.

Conclusion. The front-end investment was hardly a bandwagon response. The foresight of the strategic partnership and pre-existing network arrangements had greatly enhanced LIFE_LOCAL capabilities and shortened the time from concept to rollout. The centre was recognized as one of the best in the country and its technology development model was widely used by other local governments for joining up their services.

4.3 Case Study 3: PROCURE_LOCAL

In the period 2000-01, PROCURE_LOCAL spent approximately 459 million Euros, a 27% of its combined capital and revenue budget on goods, works and outsourced services. It went through a best value review in 2001, and out of that came a corporate procurement strategy to electronically enable their internal tendering process. In the review, consultations with the service stakeholders were held and comparisons were made with other governmental agencies; and it was concluded that no electronic procurement model was found in the public sector within the county. Rather than choosing to explore the private sector route, PROCURE_LOCAL resorted using the Internet to search for public sector projects that were similar and could offer a comparative for best value. The search identified a government in Western Australia, which was already e-tendering. PROCURE_LOCAL then initiated informal contacts to solicit for information related to the Australian business case and systems specification. And within days, the Australian came back and suggested that they would host PROCURE_LOCAL e-tendering systems (ETS) on their server, and only charged PROCURE_LOCAL for the server time. The Australian government acted as the application service provider and made cosmetic changes to their system so as to make it looked like PROCURE_LOCAL ETS. PROCURE_LOCAL regarded this contract and management services as the most cost effective way of quickly installing a proven product. The bid amounted to 0.25 millions Euros was awarded to PROCURE_LOCAL in April 2001, and the full implementation was completed in October 2001. To tackle with legal and accounting issues, a procurement board consisted of an accountant and a legal advisor was assembled to oversee the financial and legal issues related to the e-tendering processes on an ad hoc basis.

Analysis. Despite the ETS rolled out on time, problems mounted in the first six months. First, the uptake among the suppliers was slow due to the privacy and security concerns that most of the suppliers had with the e-bidding process. Second, the initial setup of ETS allowed all tender calls including those without the tender documents to go online. This only frustrated the suppliers as they logged on and only found the tender documents were not available, and had to resort to traditional means. Third, the requests for client departments to supply both tender calls and documents had caused not only resistance but also resentment as some of the client departments did not have the technological means and resources to produce electronic documents, and in order to be fully complied with the ETS requirement, they had to restructure their business processes. The focused scanning on a proven product as a silver bullet to the procurement requirement came at the expense of the lack of buy-in from the two most important partners, and at the end required further bidding for funding from the EU in order to support their frantic promotion activities in the period 2002-03. The lack of market and private sector input, and the sheer reliance on the Australian partner had limited the utilization

and the development of internal and external scanning capabilities that were critical for any future discernment of technology adoption.

Conclusion. The limited scanning had resulted in excessive corrections so as to overcome the uptake barriers. In the period of 2003-04, the government of the Western Australia had undergone an internal restructuring, and most of the members of original Australian team had also left, the contract was set to end in January 2006, and the absence of technology transfer model and an exit strategy had made PROCURE_LOCAL ever so vulnerable.

5 Discussion

This study was motivated by the need to better understand IT investment in the public sector. Here, we use a lens model to provide a framework to understand the impact of entry points on the processes undertaken in support of IT strategy development, and IT investment decision and implementation. Before discussing the findings and their implications, some of the study's limitations must be evaluated. First, the use of a small number of cases limits the generalizability of the findings. The findings are based on only three cases, one non-Western central government and two Western local governments. Second, as the cases were studied retrospectively, we had to rely on multiple sources to verify the information provided by the informants. Third, interviews were limited to a few key informants; additional informants may have further enriched the present findings. Despite these limitations, as discussed below, the present results provide some new insights into the relationship between entry points and IT success.

Table 1 provides a summary of the key findings of the case studies. In effect, we identify three specific entry points; each underline a main strategic goal: first, timely deployment of ICT to realize business values (as in PROCURE_LOCAL); second, creation of an enabling environment for strategic partnership to increase social and private capital (as in LIFE_LOCAL); and third, capacity building of skills development and implementation capabilities (as in NEW_CENTRAL). The three cases provide some preliminary evidence of how entry points can expand or limit the organizational dynamic processes in the way organizations scan internal and external environments for information that is relevant and significant to the choice of IT strategies.

First, although the e-government call gives all three governments an extra leverage to their business strategies (i.e. improving their existing model of service delivery), the entry to each strategy was very different. NEW_CENTRAL used CRFP as a "think long and hard" approach to engage the external consultants to carry out the needed research, to transfer the needed skills and knowledge internally (Cohen and Levinthal, 1990), and to build implementability (Markus and Keil, 1994). LIFE_LOCAL utilized its pre-existing strategic networks to mobilize the needed resources to warrant success in IS partnership (Adler and Kwon, 2002). PROCURE_LOCAL opted for an ASP model sourced by another public agency. The first two entry strategies involved some form of co-sourcing arrangement and provided a better approach in building long-term capabilities and lasting benefits whereas by completely hollowing out to the third parties, the last IT strategy had suffered from a series of drawbacks. The relative merits and trade-off of each approach generally concur with the literature. That is, co-sourcing carries less risk but is more resource intensive; and there is no quick fix in view of the hidden risks in the use of ASP and/or any other outsourcing models (Bahli and Rivard, 2003; Chen and Grant, 2001).

Second, whether the solutions involved the front-end or back-office integration, when scanning was incomplete, the problems would not simply go away but most likely to come back in full circle. For example, by limiting to external scanning within the public sector, PROCURE_LOCAL at the end still had to pick up the pieces due to insufficient internal and external scanning from concept to rollout. It seems the mental rush to save time (as epitomized in the first entry point) only backfires and results in losing time at a later date. Within time constraints, a near complete scanning by exhausting all the possible information sources should be sufficient to allow a better scoping of all the potential requirements and barriers, and to provide an accurate assessment of the resources needed and any required changes in a realistic timescale. With PROCURE_LOCAL, the time urgency not only

reduced scanning in the selection of vendors but also simplified strategies and caused locking in on a single strategy (Hwang, 1994), in this case, by giving all the development work and throwing all the monies to a single vendor.

Third, regarding whether the front-end or the back-office integration should go first, the present findings suggest that strategic IT investment should consider the ramifications that front-end might have on the back-office integration, and vice versa. Specifically, given the resource-taxing nature of integrating front to back operations (Barki and Pinsonneault, 2003), due attention must be first given to whether the front-end can be enabled by the back office. As shown in LIFE_LOCAL, the front-end solution required changes at the back office, and with PROCURE_CENTRAL, the back-office problems with the ETS had switched off the suppliers at the front-end. As succinctly summarized by one of our interviewees, "IT is not just the case of sticking a system in however good the system is, it won't improve the rubbish that you have already got." It is important that governments embrace the ethos of delivering better services through a range of channels including electronic ones and not simply providing existing services electronically.

5.1 Implications for practice

Governments have to recognize that different entry points implicate different levels of resource requirements, and that in turn determine how thorough and intensive scanning has to be before, during and after IT investment. Incorrect entry points coupled with incomplete scanning can only lead to an oversight of the details, and later on burden the staff involved in the design and development phase, and put off the eventual users. As governments seek to best align IT investments with their unique value proposition as determined by citizen needs, it is important to determine the right IT strategies to meet those needs. In this regard, entry points and the underlying scanning activities can provide the needed mechanism not only to validate the value of IT investment but also to assess the organizational capabilities (or lack of therein) in executing the business strategies. As clearly shown in our three cases, strategic alignment is only the beginning and has to be supported by the right structures. For instance, governments can have a dedicated group (with members of different expertise spanning across different occupational groups and organizational levels) in place to carry out periodical reviews of the organizational scanning capabilities. The reviews are to ensure that their residual capacities of scanning have not been diminished to a level, unable to cope with the complex decision processes involved in IT investment. A key advantage of having a dedicated group is to compensate for the potential cognitive limits of individual decision makers.

Lastly, the present study has shown that extensive scanning activities should not only gauge the perspectives of all key partners but also understand how services add values to the key customers including users and consumers in order to overcome any uptake barriers at the rollout stage (Chiru and Kauffman, 2000; Markus and Keil, 1994). Governments have to realize the logic of investing in a flexible technology environment that humanizes services rather than lavishing on new product developments or functions (as in LIFE_LOCAL).

Taken together, governments should work on the "what goes round comes round" principle in place of a quick fix, and should endeavour front-to-back office integration. Although traditional tendering and ASP models can offer a "quick to install" solution, governments should invest in strategic partnership and internal capabilities for future use, and attend closely to the citizen needs when determining their most strategically important areas for IT investments. Considering that e-government is here to stay, all governments in particular the central governments have to hold a strategic view of IT investment and importantly have to invest in other co-specialized assets including building strategic alliances with agencies from both private and public sectors.

This paper has several implications for research. First, the use of lens model in contextualizing scanning activities should be valuable to future research. Research on scanning may consider measuring the constructs informity and validity (e.g. Hollenbeck et al., 1995), and use the measures to empirically test the impact of scanning on organizational performance (e.g. Garg et al., 2003). Second, the present study only examined one specific type of alignments (Sabherwal, Hirschheim and

Goles, 2001). Further research is needed to examine the relationships between entry points and other types of alignments. A few variants of the research questions include: What are the roles of entry points in strategic IS management? Can entry points dislodge strategic alignment? What on the impacts of different entry points on the dynamics of changes in business, IS strategies and structures over time? Third, as governments can be considered as resource rich institutions, they can afford to experiment with new technologies, absorb any failures, and bear the cost of implementing innovative technologies. Future research can apply the present framework to examine the impact of entry points on IT investment specifically resource poor organizations where failures might have a long lasting devastating effect. Finally, although the paper has taken the perspective of public sector investors, the present framework can be also used to examine the interrelationship between entry points and scanning activities undertaken by the private sector organizations.

In conclusion, the present study has provided new insights of the impacts that entry points have on the scanning processes, the IT strategy development and IT success, specifically the ways that governments can revert a potential bandwagon e-government call into opportunities for learning and process re-engineering.

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