

Process Model of Customer-Centric E-Government Enabled Service Transformation: Insights from MINDEF's Portal Implementation Experience

Satish Krishnan, Barney C. C. Tan and Shan L. Pan,

Department of Information Systems, National University of Singapore, 3 Science Drive 2,
Singapore 117543, Singapore
{satishk, tancheec, pansl}@comp.nus.edu.sg

Abstract. Information Technology (IT) enabled transformation in an organization enhances the business value by improving its performance. Though a lot has been documented on this topic, a review of information systems literature reveal that the research on how e-government enabled transformation affects firm performance remains under-examined. With this motivation, this piece of research aims to focus on the mechanisms through which e-government enabled service transformation improves the performance of an organization. Analyzing the case study of e-government implementation experience of Ministry of Defense (MINDEF), Singapore in the light of Resource Based View (RBV) and Dynamic Capabilities perspective, we build a process model of customer-centric e-government enabled service transformation showing how MINDEF enhanced its performance. With its findings, this study contributes to the theoretical discourse on firm performance and provides implications to the practice for enhancing firm performance.

Keywords: E-government, Resources, Capabilities, Core competencies, Firm Performance, Case study.

1 Introduction

Rapid advances in IT and advent of Internet have not only changed the way the private sectors work but also the public sectors. This is due to increased exposure to the offerings of Internet which has redefined the expectations of citizens on their government and its services by demanding faster and more efficient services [33]. Thinking customer-centric and attracted by potential benefits such as cost savings and better governance, bureaucratic government organizations are now transforming to anticipative and responsive government organizations [36]. This is brought about by adopting IT and making the best use of new and emerging technologies which in turn is termed as 'Electronic Government' or 'E-Government'.

Although governments have been actively engaging in efforts to digitalize the public sector [17], they face great challenges in reinventing such vast enterprises and resources [33]. Difficulties involved in digitalizing the public sector are reflected by the contrast between the number of e-government projects being initiated and the

number of e-government projects that have progressed beyond creating a web presence [33]. Despite these initiatives and emerging programs on e-government throughout the world in all levels of government, there has been a lack of academic literature on understanding the process of e-government enabled service transformation and the mechanisms through which it affects firm performance.

With this knowledge gap, our work is aimed at studying the process of customer-centric e-government enabled service transformation. In specific, the research question we strive to address is, *'How does customer-centric e-government development enhance the firm performance?'* We answer this question by analyzing a case study of e-government implementation experience of MINDEF in the light of RBV and Dynamic Capabilities perspective.

In the remainder of the paper, we first review the existing perspectives of e-government, then present the arguments on RBV and Dynamic Capabilities, report the methodology adopted for studying the above research question, describe and analyze the MINDEF case, and discuss our findings. We conclude by highlighting the shortcomings of our research and the implications of our study for theory and practice.

2 Theoretical Background

The term '**E-Government**' has wide ranging interpretations. Organisation for Economic Co-operation and Development (OECD) defines E-Government as, "the use of information and communication technologies and particularly Internet as a tool to achieve better government". E-government discipline has received attention among researchers for more than a decade and is significantly increasing [36]. Though researchers have focussed on various dimensions of e-government like maturity [34], transformation management [36], evolution and success [17], stakeholders' interest [37] and customer relationship management [26], there are several dimensions that remains uncovered [30]. One such dimension is the relationship between 'IT-enabled transformation' and 'firm performance'. Though this term is overused in e-commerce and private sector research [30], it has received less attention in public-sector research. One key reason is because of the general misconception that the public sectors are rigid and risk-averse establishments [37].

Like e-government, the term '**Firm Performance**' also has different interpretations. Literature on organizational effectiveness indicates that the definition of firm performance varies depending on how firms are viewed [4]. It has been argued that there are at least three main perspectives on firm performance [35]. First, if firms are viewed as rational and goal-seeking entities, successful goal accomplishment would be an appropriate measure of performance. Second, if firms are viewed as coalitions of power constituencies, degree of satisfaction of employees and/or customers would be an appropriate measure of performance. And third, if firms are viewed as entities involved in a bargaining relationship with their surroundings, firm's ability to garner scarce resources and productivity would be the appropriate measures of effective performance. Though MINDEF as an organization could be viewed from all three perspectives, our interest, however is to look at the service transformation from the

view point of customer. Accordingly, we choose two measures of firm performance: 'Customer Satisfaction' and 'Service Delivery'.

To study the relationship between IT-enabled transformation and firm performance, we use two complementary perspectives as our theoretical lens: (1) RBV and (2) Dynamic Capabilities. '**RBV of a firm**' is an influential framework within the field of strategic management describing how sustainable competitive advantage can be developed [2, 40]. RBV positions a firm as a bundle of heterogeneous and imperfectly mobile resources which are valuable, rare, inimitable, durable, transparent, transferable and replicable and delivers value to the company [2, 14, 27]. Penrose [27] indicates that it is not the resources themselves that deliver value, but it is the core competencies (i.e., services rendered by resources) which organizes the resources to generate or deliver value. Core competencies are collective learning in an organization that coordinate diverse production skills and integrate multiple streams of technologies [29]. Though RBV is comprehensive [2], it has been criticized to be vague and tautological [12], observed to be lacking of empirical grounding and being more suited for only relatively stable environments [20]. This implies that it cannot be used to explain sustained competitive advantage in situations of rapid and unpredictable changes [12, 38].

To overcome the shortcoming of RBV in addressing why firms have competitive advantage in situations of rapid and unpredictable market change or dynamic markets, '**Dynamic Capabilities**' perspective was developed and characterized as an organization's processes that integrate, reconfigure, gain and release resources to match and even create market change [12]. That is, dynamic capability is a company's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments [38]. These capabilities act as an innovative basis for competitive advantage in terms of path dependencies and market positions and act as mediators determining a firm's market position and overall performance [20].

In summary, we use both these complementary perspectives as our theoretical lens to study the mechanisms underlying e-government enabled system transformation and firm performance enhancement.

3 Research Methodology

Case research methodology was adopted for this study as our research question is a "how" question [39] that delves into the process of customer-centric e-government service transformation and the underlying mechanisms through which it enhances firm performance. Based on our research question, we selected MINDEF to study the phenomenon, as it has effectively implemented e-government system for performance gains. Research access was negotiated and granted in July 2008 and a total of 17 interviews were conducted. All the interviews were transcribed for data analysis and lasted an hour on the average. Secondary data from newspaper articles, company brochures, internal publications, the corporate website and notes from direct observation were also used to corroborate the data obtained. We followed a three-step procedure for analyzing our case data [22]. First, we did '*data reduction*' which

helped us to sharpen, sort, focus, discard and organize the data in a way that allowed for 'final' conclusions to be drawn and verified. We used several means such as selection, summary and paraphrasing. After the data reduction step, we '*displayed the data*' by organizing the reduced data in a compressed way so that the conclusions could be easily drawn. Finally, we '*drew conclusions and verified them*' by noting regularities, patterns (differences/ similarities), explanations, possible configurations, causal flows and propositions.

4 Case Description

MINDEF, established in 1966 is responsible for the recruitment, training and administrative needs of the National Servicemen (NSmen) of Singapore. The ministry is tasked with overseeing the defense, manpower and technological capabilities of the Singapore. More than 40 years on, there are currently more than 300,000 NSmen in active service, forming the backbone of the national defense. As a serviceman transitions through his NS lifecycle, taking on several roles, he will require the administrative services provided by various agencies of MINDEF. Yet, with hundreds of different transactions provided by over 60 different agencies available, coordinating the administrative processes that underlie the needs of the servicemen was complex, paperwork-intensive and tedious. MINDEF slowly realized the needs for implementing e-government and started taking initiatives to move from an ordinary government to a 'Customer-centric E-Government'. Following paragraphs summarizes phase wise case details.

Phase 1: Service Delivery via Traditional Counter and Queue System (Before 1999). MINDEF's transactions were characterized by repetitive, manual work processes and each agency is responsible for their own administrative procedures. The operations were tedious, error-prone, labour-intensive and manual because of minimal integration and data sharing between the different entities. These resulted in a deep-seated inefficiency within the organization which was overcome by ample resources of MINDEF.

Phase 2: Defense Town I and II (April 1999-April 2001). First corporate website was launched in June 1996 and consisted only of static informational pages organized along departmental lines. Within a year, electronic transactions (inadequate, uncoordinated and decentralized) were made available. 18 different online transactions housed in different websites and more than 13 telephone hotlines were available which was difficult for servicemen to obtain the services they require. By the end of the Defence Town phase I, detailed information about the services and all 18 electronic transactions were made available on Defense Town. Backend processing of the submitted electronic forms remained a laborious, manual process and integration and data sharing problems remained unresolved. To look into the problem, a study team (comprising several members from different departments of MINDEF) was established to review the existing business processes. An extensive Business Process Improvement (BPI) Study was sought to streamline the operations and business process of MINDEF.

Phase II of the Defense Town project was launched in September 1999 with an aim to fully integrate online service center. Electronic transactions were integrated with relevant backend databases of MINDEF. Through this integration, manual, backend processing is no longer required after an electronic form has been submitted. In addition, benefits include: (1) Marked improvements in service cycle time, (2) reduction in the generation and mailing of paperwork, (3) diversion of labour resources to more meaningful job functions, (4) error reduction through the incorporation of computation and business rule checks into the system, and (5) marked increase in convenience for users.

Phase 3: MIW Portal Implementation (April 2001-April 2006). Defense Town project lacked strategic coherence and was curtailed by a low rate of adoption. A committee was established for the purpose of examining the organizational implications of the technology-induced upheaval in the external environment. Top management realized that Internet was a promising solution to the chronic inefficiency and bureaucratic mindset and MINDEF.com initiative was eventually launched. A closed tender was called and management of MINDEF eventually decided to award the contract to Green Dot Internet Services (GDIS).

Phase 3a: Ensuring Information and Basic Services Availability (Apr 2001-Oct 2001). MIW portal was eventually built from scratch within eight months and focus was to make all related information and existing e-services available. Initial phase was characterized by a tentative, trial-and-error approach to systems development due to the relative inexperience. Communication and coordination problems also existed. In addition to the technical challenges, there was also a sense of apprehension among internal MINDEF departments and agencies. A steering committee was formed to overcome the resistance of internal stakeholders. The initial MIW portal was not well received due to poor navigability, lack of aesthetic appeal and poor content organization of the website. A decision was made to revamp the portal just 6 months after its initial launch.

Phase 3b: Improving the Quality of Services (Nov 2001-Apr 2004). A series of usability studies were conducted and user interface was revamped to improve the usability, utility and attractiveness. Contents of the portal were reorganized and accessibility of the services was enhanced. Usage of new platforms like WAP, SMS, etc resulted in a greater flexibility and continuous stream of new applications and e-services were introduced. Internal stakeholders at MINDEF were often apprehensive about experimenting new technologies. To overcome this, the management of MINDEF was highly supportive, encouraging and tolerant of failure. As a result, the portal was well received by the customers with approximately 300,000 transactions per month.

Phase 3c: Providing a Positive National Service Experience (May 2004-Apr 2006). The “stickiness” of MIW portal was increased through a comprehensive rebranding initiative. A comprehensive change management exercise was conducted to overcome the data sharing, coordination and collaboration challenges. Toward the attainment of this strategic objective, a number of new features (e.g., My MIW, MIW Shopzone and MIW Game Center) were implemented on the MIW portal. In addition, MINDEF sought to foster the creation and maintenance of social relationships between servicemen through the cultivation of virtual communities hosted on the

MIW portal. As a result, volume of transactions handled by the MIW portal doubled to an average of more than 600,000 a month.

Phase 4: NS Portal Implementation (May 2006-Present). MINDEF needed to collaborate with Ministry of Home Affairs (MHA) to ensure the security and the defense of the country. A joint decision was made to collaborate on the development of an integrated portal. Decision was made to not pursue the contractual option of continuing with GDIS for the next five years and call for an open tender. MINDEF used ‘Analytic Hierarchy Process’ to form an objective judgment. The contract was eventually awarded to the vendor (NCS) with the highest cost benefit ratio.

Phase 4a: The Challenges of Migration (May 2006-Apr2007). The first stage of migration involved the migration of static and non-transactional websites and the second stage involved the migration of the main Internet portal. Issue of brand confusion and inexperience of NCS in running a full-fledged e-government portal were two main challenges. A third related challenge concerned the inevitable, “starting over” of the cultivation of virtual communities. MINDEF invested extensive resources and efforts in trying to overcome these challenges. The URL for the new portal (<http://www.ns.sg>) was carefully formulated to be easier to remember and more relevant to NS as compared to the old URL. Customer satisfaction with the new NS portal tumbled to 88.12%. Yet, within a year, NCS was able to restore operational excellence by reinstating and improving on most of the features of the previous portal.

Phase 4b: Promoting NS Commitment (Apr 2007-Present). With the teething issues of portal migration resolved, NCS was ready to bring the quality of the public services of both MINDEF and MHA to the next level. Accordingly, the focus of e-government development had shifted beyond providing a positive NS experience to the overarching strategic vision of promoting NS commitment among Singapore’s NS community. To this end, NCS designed and deployed a number of new features on the NS portal in accordance with a two-pronged strategy. First, NCS is seeking to enhance the relationship and community building capabilities of the NS portal further by developing website features that facilitate the creation of social bonds and a sense of belonging. Second, NCS is looking to enhance the variety and richness of the applications on the mobile channel through the launch of the Mobile eServices Hub (MeSH); a sophisticated bundle of mobile applications consisting of a comprehensive suite of mobile e-services, a messaging system, lifestyle content and location-based services.

5 Case Analysis and Discussion

As e-government success is necessarily defined by the end-user satisfaction [36], our knowledge on how e-government implementation success can be achieved is contingent on understanding the inherent process through which e-government development enhances the services of a public organization. Toward this end, a model of this underlying process; which we term ‘*Customer-centric E-government Enabled Service Transformation*’, is constructed based on empirical evidences from the MINDEF case study (see Figure 1). Through this process model we gain insights into: (1) the resources necessary for successful e-government implementation, (2) the

organizational capabilities and the organizational core competencies that are developed or enhanced through the e-government implementation, and (3) how these resources, capabilities, and core competencies enhance the organizational performance.

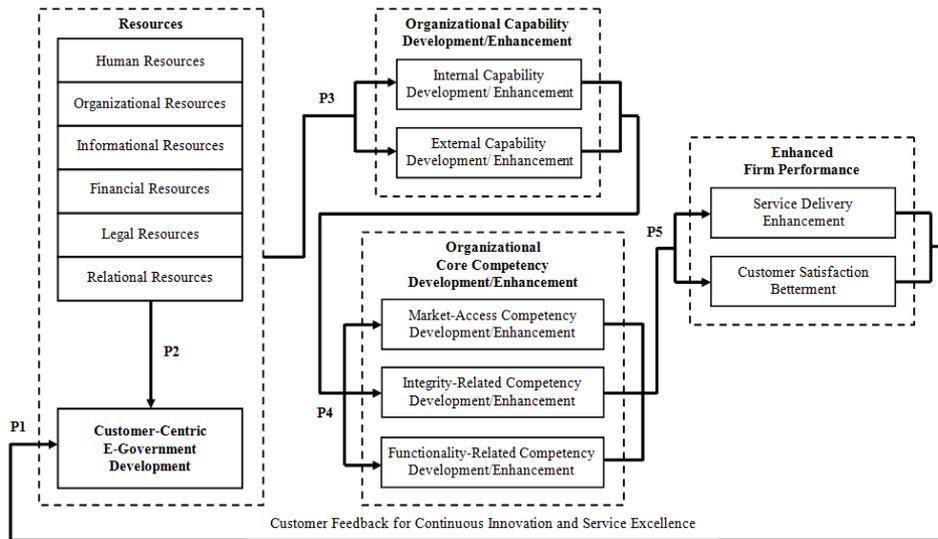


Fig. 1. Process Model of Customer-centric E-government Enabled Service Transformation

5.1 Customer Satisfaction for Continuous Innovation and Service Excellence

Before we proceed to know the importance of resources-capabilities-core competencies in the process of customer-centric e-government enabled service transformation, it is necessary to know what a customer-centric e-government is and how it is different from an organization-centric e-government. An organization-centric e-government is developed giving less or no importance to the customer's needs and feedbacks. This is called as treating the *'customers as outsiders'* and *'customers as clients'* during the service transformation [36]. As a result, his satisfaction level with the services provided by the e-government is either negligible or low and no value or only an internally-focused operational value is created [36]. On the other hand, a customer-centric e-government is developed by involving the customers in each and every phase of e-government development. This is called as treating the *'customers as valued customers'*, *'customers as strategic partners'*, and *'customers as strategic value networks'* during the service transformation [36]. As a result, the satisfaction level with the services provided by the e-government is high or sustained or complete (total) respectively and the value created is either operational or strategic or multi-directional strategic [36].

MINDEF initially treated its 'customer as outsiders'. Proceeding through the process of service transformation, MINDEF realized the importance of engaging the end-user in the e-government development and gradually started treating its customers as clients, valued customers, strategic partners, and finally as strategic

value networks. During the phase 1 and phase 2 of service transformation, MINDEF treated its customer as ‘outsiders’. As a result, the customer satisfaction was low. During the first, second and third phase of MIW portal implementation (phase 3a, 3b and 3c), MINDEF treated its customers as ‘clients’, ‘valued customers’, and ‘strategic partners’ respectively. Accordingly, the customer satisfaction was increased, high and sustained. During the final phase of service transformation (phase 4a and phase 4b), MINDEF treated its customers as ‘strategic partners’ and ‘strategic value networks’ respectively. Accordingly, the customer satisfaction was sustained and complete (total). This facilitated continuous innovation and service excellence which in turn led to total customer satisfaction and multi-directional strategic value creation. Accordingly, we propose:

Proposition P1: *Involving customers during the process of service transformation and satisfying their needs and expectations are the necessary conditions for developing a successful customer-centric e-government.*

5.2 Resources Required for Customer-Centric E-Government Development

A customer-centric e-government cannot happen accidentally. Large number of resources is required for developing it successfully. To achieve competitive advantage [2], the resources of the firm must be *valuable* (the resource can enable a firm to conceive or implement strategies that improve its efficiency or effectiveness), *rare* (the resources should not be possessed by a large number of competing firms), *imperfectly imitable* (the resources should not be easily imitated due to unique historical conditions, causally ambiguous, or social complex) and *non-substitutable* (the resource should not be easily replaced by other substitutes).

In MINDEF’s case, six categories of resources were identified as valuable, rare, imperfectly imitable and non-substitutable for the developing a customer-centric e-government successfully and improving the performance of the organization: (1) Human Resources, (2) Organizational Resources, (3) Informational Resources, (4) Financial Resources, (5) Legal Resources, and (6) Relational Resources. We categorize personal networks, individuals’ experience and education/skill level of the individuals in MINDEF and other personal attributes as ‘**Human Resources**’. Culture, structure, routines, processes, and brand/reputation of MINDEF are classified as ‘**Organizational Resources**’. Information related to the customer, vendor (partner), and services are categorized as ‘**Informational Resources**’. The funds and financial instruments in developing the e-government are classified as ‘**Financial Resources**’. The assets like agreements, licenses and government regulations are categorized as ‘**Legal Resources**’. Relationships inside the firm, relationships with the partner organization and agencies and relationships with the customer are categorized as the ‘**Relational Resources**’.

These six categories of resources facilitated the development of customer-centric e-government thereby improving the firm performance [31]. These resources acted as triggers or drivers for developing a customer-centric e-government. With this, we posit that the above resources are necessary (1) to successfully build a customer-

centric or customer-focused e-government and (2) to enhance the performance of the organization. Accordingly, we propose:

Proposition P2: *Existence of human, organizational, informational, financial, legal and relational resources in an organization determines the development of successful customer-centric e-government and the enhancement of firm performance.*

5.3 Capability Development/Enhancement

Though resources can have direct effect on firm performance, several researchers argue that the effect of valuable resource may need other factors. While researchers on one hand argue that integration of different complementary resources can generate synergy that can lead to better performance [21, 41] others propose that the factors such as strategic fitness can enhance firm performance [6, 7, 25]. Among those possible factors, organizational capabilities are the most liked mediators in existing literature [1, 5, 6, 16, 30, 32]. The rationale is that valuable resources can provide or enhance capabilities to deal with customers' needs and expectations.

In MINDEF, the above six categories of resources facilitated the development and enhancement of capabilities which paved the way for firm's performance enhancement. Top management and project team developed these capabilities based on several initiatives. We use Montealegre's process model of capability development [23] to explain the key initiatives taken by MINDEF to develop and enhance the capabilities.

Global Benchmarking and Training. Benchmarking was used to evaluate the effectiveness and relevance of MINDEF's operations. Extensive BPI study was conducted and change management exercises were initialized to overcome several challenges like streamlining the operations and the business process of MINDEF. The executives' awareness and heightened sensitivity to the service environment enabled the organization to identify and adapt best practices in its management and operations [18], which also helped MINDEF in identifying the customer needs and expectations.

Learning from Past Experiences and History. Learning from unique organizational history implies path dependency, which contributes to the inimitable nature of an organization's resources or capabilities [2]. In our case, MINDEF had in-depth knowledge on the mechanisms of e-government service delivery as it was delivering services for several years. It also enjoyed close coordination with many of its operational departments and agencies.

Absorbing Knowledge as a Unified Group at the Top of the Organization. Exchanging ideas through shared narratives of individual experiences contributes to the development of corporate vision [24]. MINDEF's top management was committed to supporting an open learning environment, in which the experiences of its employees were highly valued. Top management of MINDEF was highly supportive, encouraging and tolerant of failures. MINDEF made the resources in terms of funding and manpower readily available. Constant encouragement was provided to develop new ideas.

Integrating Resources into Core Activities. In order to build the capabilities, resources must be sufficiently integrated with key activities and organizational routines [38]. At MINDEF, valuable resources were allocated appropriately to ensure that the organization would not lose focus on essential operations while executing its new strategies. To minimize disruptions in the daily operations, several committees were established by the top management of MINDEF which met frequently. These committees (1) examined the organizational implications of the technology-induced upheaval in the external environment and (2) periodically conducted comprehensive studies of servicemen population to understand their needs and expectations and on the quality of the services delivered.

Experimenting. Experimentation is a mechanism for capability building through performing incremental improvements to operational routines [11]. Continuous experimentation is a key characteristic of successful firms [9]. At MINDEF, experimentation with new technologies and testing them were mechanisms used iteratively to improve service delivery continually. Experience gained from experimentation resulted in an optimal service model. Employees' feedback coupled with the customer needs and expectations and regulatory requirements paved the way for developing optimal and user-friendly applications and services.

Investing in, Leveraging, and Co-opting Resources. MINDEF aimed to surpass customer expectation by developing and improving its capability to provide more value-added services. This aim was achieved by improving its business processes and leveraging the existing manpower. Leveraging technology as a resource to improve processes within and across business functions developed capabilities [15].

Gaining Internal Commitment. MINDEF adopted the selective use of high-involvement work practices, which helped to increase job satisfaction and positive attitudes, thereby leading to increased profitability [3]. For example, during the meetings that spanned various functional divisions, steering committee were involved in fostering greater commitment with the team members to implement the changes. Furthermore, by empowering service representatives with greater autonomy to make decisions increased their ability to solve customer problems and helped to foster an open and innovative culture in MINDEF [10, 18].

Investments in complementary Infrastructure. Infrastructure frameworks are necessary to facilitate successful transfer of processes and activities. MINDEF invested in technology infrastructure to optimize its daily operations, which then formed the strong foundation of resources that were leveraged to develop capabilities. For instance, MINDEF developed iMIS for computerization and process automation.

Strengthening External Relationships. Effective management of collaborative relationships through close communication between vendors and customers can allow a high level of internal coordination and process integration [9]. Establishing and maintaining strategic partnerships with various stakeholders were essential to MINDEF in maintaining its ability to deliver customized services [26]. MINDEF built a long-term strategic partnership with its vendors and other government agencies (e.g., MFA) through close communications and interactions.

Based on the above explanations and chain of evidences we posit that resources available with the organization facilitate development and enhancement of capabilities of an organization. These newly developed capabilities and enhanced

existing capabilities mediate the resources that can enhance the performance of a firm. Accordingly, we propose:

Proposition P3: *Existence of human, organizational, informational, financial, legal and relational resources determines the development of new capabilities and the enhancement of existing capabilities. These newly developed capabilities and enhanced existing capabilities are necessary for improving firm performance.*

5.4 Core Competencies Development/Enhancement

Core competences are those that make a disproportionate contribution to ultimate customer value, or to the efficiency with which that value is delivered and provide a basis for entering new markets [29]. Core competencies which can be developed or enhanced by developing or enhancing the organizational capabilities can be categorized into three types [30]: market-access competencies, integrity-related competencies and functionality-related competencies.

'*Market-access Competencies*' include all those that allow an organization to be in close proximity to its customers, identify their needs effectively and respond in a timely manner to shifts in customer needs and tastes [30]. MINDEF developed/enhanced the market-access competencies through comprehensive branding/ rebranding initiatives and by tailoring the offerings to match the demands of the customer. '*Integrity-related Competencies*' include those that allow a firm to offer reliable products and services at competitive prices and deliver them with minimal inconvenience [30]. MINDEF developed/enhanced the integrity-related competencies by investing in new technologies. '*Functionality-related Competencies*' are those that enable a firm to offer unique products and services with distinctive customer benefits [30]. MINDEF developed/enhanced the functionality-related competencies by doing innovations in the new services.

All these three core competencies enhanced the performance of MINDEF by enhancing the service delivery and increasing the customer satisfaction thereby making a significant contribution to customer perceived value and customer perceived benefits. Accordingly, we propose:

Propositions P4 and P5: *Developing new capabilities and enhancing existing capabilities are necessary for successful development and enhancement of core competencies. These newly developed core competencies and enhanced existing core competencies are necessary for improving firm performance.*

6 Conclusion

By addressing the research question set forth at the beginning of the paper, this study makes two important contributions to the theory. First, while significant research has focused on IT-enabled system transformation and firm performance relationship in e-commerce and private sector research [30], the mechanisms through which how e-

government enabled system transformation affects firm performance remain under-examined. This study, based on RBV and dynamic capabilities perspective, has attempted to bridge this gap. Previous studies on the related topics have focused on (1) how IT system could be used to exploit the unique structural characteristics of a firm [8], and (2) how the value of IS resources could be enhanced in the presence of other business resources such as an innovative culture [28]. Our study extends this line of research by examining the mechanisms through which e-government service transformation affects firm performance. Second, the process model of e-government enabled service transformation developed here can serve as a basis for firm performance evaluation using two measures: customer satisfaction and service delivery. Our study adds to the performance research and provides a basis for the development of performance assessment tools for managerial use from the view point of customer [13, 31].

From a practical standpoint, this study makes two main contributions. By providing evidences that core competencies can affect firm performance, this study highlights that managers have to do more than investing in the latest technologies or developing a strong IS department. To do so, the managers have to clearly understand the strategic thrust of the organization and institute mechanisms to ensure that the capabilities are channeled toward areas of importance to the organization [30]. Second, our study provides evidences for the types of resources that are necessary to build a customer-centric e-government through which organizational capabilities and core competencies can be enhanced/developed thereby enhancing the firm's performance.

Findings of this study should be viewed within the context of its limitations. In particular, although the single case research methodology adopted in this study is a "typical and legitimate endeavor" in qualitative research [19], a common criticism of the methodology is the problem of generalizability or external validity [39]. However, while it must be readily acknowledged that the single case research methodology makes statistical generalization impossible, we nevertheless assert that our study is valid and generalizable beyond its singular context as the developed process model is not only grounded in the empirical reality of a real world organization, but also corroborated by the propositions of some of the most established works in management and IS literature. As such, this study invokes the principles of "analytic generalization" [42] or what some researchers refer to as "*generalizing from description to theory*" [19]. Nevertheless, future research can be directed at statistically validating the propositions of our process model, so that the boundary conditions of our study can be better defined.

In summary, based on the evidences from MINDEF's portal implementation experience, we would like to reiterate that the existence of resources and involving the customers during the transformation process would trigger successful development of customer-centric e-government. The newly developed customer-centric e-government system along with the resources would facilitate development of new organizational capabilities and enhancement of existing organizational capabilities which in turn would lead to development and enhancement of core competencies. In short, resources, capabilities and core competencies would facilitate the enhancement of firm performance by improving the customers' satisfaction and enhancing the service delivery mechanisms.

References

1. Bharadwaj, A. S.: A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation, *MIS Quarterly*, vol. 24, pp. 169-196 (2000).
2. Barney, J.: Firm resources and sustained competitive advantage, *Journal of Management*, vol. 17, pp. 99-120 (1991).
3. Batt, R., and Moynihan, L.: The viability of alternative call centre production models, *Human Resource Management Journal*, vol. 12, pp. g14-34 (2002).
4. Bedeiar, A. G., and Zammuto, R.F.: *Organizations: Theory and Design*. New York: The Dryden Press (1991).
5. Bhatt, G. D., and Grover, V.: Types of Information Technology Capabilities and Their Role in Competitive Advantage: An Empirical Study, *Journal of Management Information Systems*, vol. 22, pp. 253-277 (2005).
6. Chan, Y. E., Huff, S. L., Barclay, D. W., and Copeland, D. G.: Business Strategic Orientation, Information Systems Strategic Orientation, and Strategic Alignment, *Information Systems Research*, vol. 8, pp. 125-147 (1997).
7. Choe, J.M. "The effect of environmental uncertainty and strategic applications of IS on a firm's performance," *Information and Management*, (40:4), 2003.
8. Clemons, E.K., and Row, M.: Sustaining IT advantage: The role of structural differences, *MIS Quarterly*, vol. 15, pp. 275-292 (1991).
9. Day, G.S.: The capabilities of market-driven organizations. *Journal of Marketing*, vol. 58, pp. 37-53 (1994).
10. Deery, S., and Kinnie, N.: Call centres and beyond: A thematic evaluation, *Human Resource Management Journal London*, vol. 12, pp. 3-13 (2002).
11. Dosi, G., Nelson, R.R., and Winter, S.G.: Introduction: The nature and dynamics of organizational capabilities. *Nature and Dynamics of Organizational Capabilities*, pp. 1-22 (2000)
12. Eisenhardt, K.M. and Martin, J.A.: Dynamic Capabilities: What are they? *Strategic Management Journal*, vol. 21, pp. 1105-1121 (2000).
13. Galetta, D.F., and Lederer, A.L.: Some cautions on the measurement of user information satisfaction. *Decision Science*, vol. 20, pp. 419-438 (1989).
14. Grant, R.M.: The Resource-Based View of Competitive Advantage: Implications for Strategy Formulation, *California Management Review*, vol. 33, pp. 114-35 (1991).
15. Jarvenpaa, S.L., and Leidner D.E.: An information company in Mexico: Extending the RBV of the firm to a developing country context. *Information Systems Research*, vol. 9, pp. 342-361 (1998).
16. Karimi, J., Somers, T. M., and Bhattacharjee, A.: The role of information system resources in ERP capability building and business process outcomes, *Journal of Management Information System*, vol. 24, pp. 221-260 (2007).
17. Ke, W. and Kee Wei, K.: Successful E-Government in Singapore, *Communications of the ACM*, vol. 47, pp 95-99 (2004).
18. Lawson, B., and Samson, D.: Developing innovation capability in organizations: A dynamic capabilities approach. *International Journal of Innovation Management*, vol. 5, pp. 377-400 (2001).
19. Lee, A.S., and Baskerville, R.L. Generalizing generalizability in information systems research, *Information Systems Research*, vol 14, pp 221-243 (2003).
20. Leonard-Barton, D.: Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development, *Strategic Management Journal*, vol. 13, pp. 111-125 (1992).
21. Melville, N., Kraemer, K., and Gurbaxani, V.: Review: Information technology and organizational performance: an integrative model of IT business value, *MIS Quarterly*, vol. 28, pp. 283-322 (2004).

22. Miles, Matthew B. and Huberman, Michael A.: *Qualitative Data Analysis*, Second Edition (1994).
23. Montealegre, R.: A process model of capability development: Lessons from the electronic commerce strategy at Bolsa de Valores de Guayaquil. *Organization Science*, vol. 13, pp. 514–531 (2002).
24. Nonaka, I.: A dynamic theory of organizational knowledge creation. *Organization Science*, vol. 5, pp. 14–37 (1994)
25. Palmer, J. W. and M. L. Markus.: The Performance Impacts of Quick Response and Strategic Alignment in Specialty Retailing." *Information Systems Research*, vol, 11, pp. 241 (2000).
26. Pan, S-L, Tan C-W and Lim, E.: Customer Relationship Management (CRM) in E-Government: A Relational Perspective. *Decision Support Systems* vol. 42, pp. 237-250 (2006).
27. Penrose, E. T. *Theory of the Growth of the Firm*, Oxford Publishing (1959).
28. Powell, T.C., and Dent-Micallef, A.: Information technology as competitive advantage: The role of human, business, and technology resources. *Strategic Management Journal*, vol 18, pp. 375-405 (1999).
29. Prahalad, C.K. and Hamel, G.: The core competence of the corporation, *Harvard Business Review*, vol. 90, pp. 79-91 (1990).
30. Ravinchandran, T. and C. Lertwongsatien.: Effect of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective, *Journal of Management Information Systems*, vol 21, pp. 237-276 (2005).
31. Saunders, C.S., and Jones, J.W.: Measuring performance of the information systems function. *Journal of Management Information Systems*, vol. 8, pp. 63-82 (1992)
32. Santhanam, R., and Hartono, E., Issues in Linking Information Technology Capability to Firm Performance, *MIS Quarterly*, vol 27, pp. 125-153 (2003).
33. Seneviratne, S.J.: *Information Technology and Organizational Change in the Public Sector, Information Technology and Computer Applications in Public Administration: Issues and Trends* edited by G. David Garson. PA, Idea Group Publishing, pp. 41-61 (1999).
34. Shackleton, P., Fisher, J., and Dawson, L.: From Dog Licences to Democracy: Local Government Approaches to E-Service Delivery in Australia. Paper presented at the Thirteenth European Conference on Information Systems, Regensburg, Germany (2005).
35. Soh, C., and M. L. Markus.: How IT creates business value: A process theory synthesis. *Proceedings of the 16th International Conference of Information Systems*, Amsterdam, The Netherlands (1995).
36. Tan, C.W. and Pan, S.L.: Managing e-transformation in the public sector: an e-government study of the Inland Revenue Authority of Singapore, *European Journal of Information Systems*, vol. 12, pp. 269-281 (2003).
37. Tan, C.W., Pan, S.P., Lim, E.T.K.: Managing stakeholder interests in e-government implementation: lessons learned from a Singapore e-Government project, *Journal of Global Information Management*, vol. 13, pp.31-54 (2005).
38. Teece, D.J., Pisano, G. and Shuen, A.: Dynamic Capabilities and Strategic Management, *Strategic Management Journal*, vol. 18, pp. 509-533 (1997).
39. Walsham, G.: Doing interpretive research, *European Journal of Information Systems*, vol. 15, pp 320-330 (2006).
40. Wernerfelt, B.: A Resource-based view of the firm, *Strategic Management Journal*, vol. 5, pp. 171-180 (1984).
41. Wade, M., and Hulland, J.: Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research, *MIS Quarterly*, vol. 28:1, pp. 107-142 (2004)
42. Yin, R.K.: *Case Study Research: Design and Methods*, Sage, Thousand Oaks, CA, (2003).