Enhancing Information Services through Public–Private Partnerships: Information Technology Knowledge Transfer underlying Structures to Develop Shared Services in the U.S. and Korea

Seok-Jin Eom  
Seoul National University, Korea

Jane E. Fountain  
National Center for Digital Government and University of Massachusetts Amherst, USA

Enhancing Information Services through Public–Private Partnerships: Information Technology Knowledge Transfer underlying Structures to Develop Shared Services in the U.S. and Korea

ABSTRACT
What are e-government success factors for using public-private partnerships to enhance learning and capacity development? To examine this question, the authors developed a comparative case analysis of the development of the Business Reference Model (BRM), a national-level e-government initiative to promote shared information services, in the U.S. federal government and the Korean central government. The results indicate institutional arrangements deeply affect the outcomes of knowledge transfer. The study shows that private sector partners in both countries played various roles as “brokers” of information technology (IT) knowledge between government and the private sector by: raising awareness of the necessity of the BRM; providing best practices; developing pilot projects; and developing implementation strategies. However, the study finds that the two countries took entirely different approaches to working with non-governmental organizations in BRM development with implications for project success and lessons for e-government success. The study is meant to deepen understanding of the embeddedness of public-private partnerships in institutional contexts and the implications of such institutional arrangements for knowledge sharing on e-government success. The study examines knowledge transfer in the context of similarities and differences in partnership structures across two advanced industrialized countries with leading roles in e-governance.

INTRODUCTION
Public-private partnerships (PPPs) are a vital driver of e-government success. Practitioners require knowledge concerning how to develop and sustain successful PPPs to develop e-government. Researchers require knowledge about the underlying characteristics that lead to success or failure of PPPs in e-government development. Thus, this chapter examines the following types of questions: How do government agencies learn from non-governmental organizations in their quest for e-government success? More specifically, how do governments adopt and adapt policies, practices and knowledge from non-governmental sectors? How do federal governments develop inter-organizational relationships across sectors (public, private and non-profit) to enhance and speed learning and development of new e-government capacity? How do countries differ in their approaches to these challenges?

As an effective way of developing government IT capacity with relationship to private actors, public-private partnerships (PPPs) have been paid attention to not only by government practitioners but also by academic researchers. In e-government developments, PPPs have become an accepted management practice as a large percentage of IS/IT projects have been outsourced (Swar et al. 2012; Currie 1996). Therefore, various PPP measures of effectiveness such as active communication with e-government users, strategic IS/IT partnerships with various IS/IT experts, and effective outsourcing management have been recommended as key success factors for e-government building by IS/IT project management tools for public agencies (Gil-Garcia and Pardo 2005). With these trends in practice, recent research has enhanced our understanding of the activities of private firms in providing information services and building e-government (Fountain 2007; 2001; Dunleavy et al. 2006; Yildiz 2004; Margetts 1999). More specifically,
a stream of research has developed on the key dimensions of IS/IT outsourcing and the determinants of effective relationships for IS/IT outsourcing success in the public sector (Swar et al. 2012; Moon et al. 2007, Van Der Der Wal et al. 2006).

However, we argue that research on PPPs in public sector, and specifically for e-government, remains under produced. It is difficult to find prescriptive recommendations for e-government practitioners on IS/IT outsourcing (Lin et al. 2007; Moon et al. 2007). Moreover, close analysis of the concrete activities of private partners and their interactions with government organizations over time remains insufficiently examined. In spite of the prevalence of such practices across governments, little cross-national comparative research on these questions has been undertaken in spite of the fact that different central governments have institutionalized different types of public-private partnerships.

In order to shed light on these issues and to overcome some of the limitations of previous research, the authors developed two detailed case studies to examine inter-organizational developments across sectors, including and moving beyond PPPs. The empirical setting for the two case studies includes the agencies and other organizations central to the development of the Business Reference Model (BRM) in the federal government of the U.S. and the central government of Korea. The BRM, one of the national e-government initiatives in both countries, is a means to develop shared definitions of data across government programs and agencies. A "dictionary" of sorts is created that can then serve the needs of different agencies thereby making shared data and shared, interactive services for civic engagement possible. Private firms spent about a decade developing BRMs for use in the private sector. The U.S. and Korean governments sought to learn from these firms in order to move quickly to develop core capacity to support new shared services for civil society. The BRM is “invisible” to most citizens and clients of e-government, but its influence on the cost and effectiveness of shared services for civil society is a critical e-government success factor.

Primary data sources for this study include the results of face-to-face interviews with key managers and stakeholders from the core organizations involved in the development of the BRM in Washington, D.C. and Seoul. Moreover, the authors gathered and analyzed a wealth of archival information, including white papers, congressional testimony, policy reports, and other internal documents, to build a rich understanding of the network of public, private and non-profit organizations involved in each country and to examine the nature of the interactions among organizations in building the BRMs in each government. The case studies are illustrative and have not been selected to develop or test predictive theory.

The organization of this chapter is as follows. In the next section we briefly review theoretical concepts and previous research on PPPs in the areas of information services and e-government. In the third section, we sketch the development of the BRM initiatives in each government. In the fourth section, we analyze the PPPs that developed during the course of building BRMs centering on the identification and roles of private partners. Based on these analyses, in the final section we identify key similarities and differences between the two governments and discuss the implications of these findings for e-government success.

BACKGROUND
Public-private partnerships may be defined in various ways. By definition, they are organizational arrangements with a sector-crossing or sector-blurring character (Schuppert 2011). They have been defined as combinations of government resources with those of private agents developed to achieve societal goals with an emphasis on resource mobilization (Skelcher 2008). In this chapter, we define PPPs not only in terms of collaborative public service provision in the narrow sense, but also in terms of the
range of cooperation among actors from public and private actors that can be brought to bear to increase the probability of success in e-government.

**Public-private partnerships for Information Services and e-Government**

According to Borzel and Risse (2005), the functions or the content of PPPs may be distinguished as follows: (1) consultation with and cooptation of private actors; (2) co-regulation of public and private actors; (3) delegation to private actors; and (4) private self-regulation in the shadow of hierarchy. The forms taken by PPPs also vary and include, for example, contracting-out of services, business management of public utilities, and the design of hybrid organizations for risk sharing and co-production between government and private agents. In general, PPP forms may be categorized into: (1) public leverage; (2) contracting-out; (3) franchising; (4) joint ventures; and (5) strategic partnering (Skelcher 2008).

For more than the past decade, PPPs have been popular as a ‘new model of governance’ and a key form of ‘collaborative governance’ (Peters and Pierre 2000). Public administrators all over the world have sought to adopt PPPs in their government practice; using them has been considered a sign of a modernizing government (Schuppert 2011). The major rationale for adopting PPPs rests on the benefits that are expected to arise from the combination of public and private resources deployed in pursuit of achieving public goals including improvements in efficiency, promotion of public participation, increasing competition for supplying public services, and enhancement of policymaking capacity. Notions of complementarity, synergy, and positive-sum outcomes between public and private sectors are key drivers (Pierre and Peters 2005; Salamon 2002). In brief, the “theory” of PPPs is that capture of expertise and effective practices from multiple sectors will lead to improvements in governance. The theory has particular weight in e-government because of the rapidity of technological change and the presumed benefits of cross-sectoral knowledge transfer. The justification for examining PPPs in light of e-government success stems from the widespread adoption of this theory and from the ubiquity of PPPs in contemporary governments.

Public-private partnerships have been important as dependent and independent variables in research on information services and e-government. Researchers have tried to identify key participants in e-government policy not only from the public sector but also from the private sector. For example, Fountain (2007; 2001) examined bureaucratic politics in the course of building cross-agency government capacity and analyzed public participants and their interactions under a range of institutional and procedural constraints. A key project examined was Grants.gov, one of the major e-government initiatives of the Bush administration. Yildiz found that a variety of civic groups such as information technology (IT) companies, academia, and non-profit organizations (NPOs) play diverse and critical roles in building Turkish e-government (2004). Similarly, researchers have observed that public enterprises, quasi-governmental research institutes and university professors have participated in the development of Korean e-government policy alongside government agencies, IT firms, and NPOs (Song and Cho 2007; Phang 2002).

Some researchers have focused on the significance and influence of specific actors in the e-government development process. It has been argued that IT firms and business consultants have played critical roles in government IT adoption based on their IT knowledge and experiences which have been accumulated with diverse IT/IS projects in several countries including the U.S. and U.K. (Saint-Martin 2005; 2004; Snellen 2005; Dunleavy et al. 2006; Fountain 2001; Margetts 1999). In addition, a line of research notes that professional associations have played critical roles in the diffusion of IT systems in government. Professional associations have intermediated and coordinated the activities of a group of would-be adopters, have provided best practices, and have set the trends for IT adoption in government (Damsgaard and Lytyinen 2001; Swan et al. 2000; 1999).
Other lines of research have focused on the status, rationales for and characteristics of government IS/IT outsourcing, a specific type of PPP. For example, Ni and Bretschneider (2007) found that the important factors affecting state-level contracting decisions on IT outsourcing are population size, market size, the competitiveness of the bidding process, the professional management of contracts, the partisan composition of legislatures, and political competition. Lacity and Willcocks (2000) surveyed 600 U.K. and U.S. CIOs to examine the proportion of outsourcing projects, satisfaction level with contractors’ performance, and the types of IT outsourcing projects most frequently engaged in. Some scholars stress differences in the characteristics of IT outsourcing between the private and public sectors (Lin et al., 2007; Khalfan, 2004). It is argued that public IT managers should have a good understanding of these sectoral differences because public sector IT outsourcing projects differ systematically from those in the private sector (Swar et al. 2012).

Another important line of research on PPPs in e-government has focused on practical issues. Some studies have articulated key success factors for PPPs when used to improve information services (Institute for Public-Private Partnerships 2009; Sharma 2007; Langford and Roy 2006; Chen and Perry 2003; Langford and Harrison 2001). It is argued that the major challenges of PPPs in this field are core partnering tasks including establishing a management framework for partnering; finding appropriate partners and making productive, feasible partnering arrangements; the management of relationships with partners in a network setting; and performance measurement of e-government partnerships (Institute for Public-Private Partnerships 2009).

Previous research has increased understanding of the structure and behavior of PPPs in information services and e-government building. Nevertheless, some weaknesses can be pointed out as follows. First, several studies note that analysis of the concrete activities of private partners and their interactions with government actors remains insufficiently examined. For example, researchers lack detailed understanding of the specific knowledge on e-government and information services that has been delivered through PPPs and how the division of labor among various private partners has been organized. In particular, issues related to IT knowledge transfer from private to public sector through PPPs have not been fully examined although many government IT studies have noted the asymmetry of IT knowledge levels between public and private partners in building e-government (Dunleavy et al. 2006; Saint-Martin 2005; Fountain 2001).

Second, most previous research has focused on PPPs as instruments of implementation. Thus, the authors of this chapter argue that research should be expanded to the planning and policy formulation stages of e-government and IT policy because partnerships in these stages more strongly influence public information services than do partnerships during implementation. The PPPs in the planning and policy formulation stages affect overall orientations of IT projects and important issues such as who participates in policymaking and the contractual terms adopted for initiatives.

Lastly, a cross-national comparative perspective contributes to research because different countries have institutionalized different systems of PPPs (Borins 2007; Skelcher 2005; Fountain 2003). For example, Dunleavy and colleagues (2006) showed that government-IT industry relations in seven developed countries differ based in part on the competition level in government IT contracting and the influence of large IT firms. Considering the importance of these differences for central governments, the authors argue that adopting a comparative perspective can contribute to a more generalized understanding of PPPs in shared information services and IT policy.

In order to fill these gaps, the authors compare the activities of private partners involved in the building of BRMs in the U.S. and Korean central governments. We seek to shed light on the following questions: Who were the private partners for the BRM initiatives in both countries? What activities were carried out by the private partners? What kinds of knowledge and information were transferred through the PPPs?
What are the principal similarities and dissimilarities between the two cases, and what accounts for the differences? What lessons might be offered concerning e-government success from an examination of these experiences?

**Knowledge Transfer between the Public and Private Sector**

A critical argument for the use of PPPs in e-government is that multi-sectoral partnerships enhance effective transmission of knowledge to government from the private sector. Such transmission is critical to e-government success. The roles of knowledge for policy making are important and varied. To make policy, decision makers, including politicians and high-ranking public officials, rely heavily on ideas and knowledge (Rueschemeyer 2006; Hall 1989). In other words, ideas and knowledge matter because actors in the political arena act and play their roles based on their ideas and knowledge. It follows that new ideas and knowledge can cause a shift in the decision-making orientation of policy makers and political elites. And once institutionalized, their influence can be reinforced and strengthened over time (Fountain, 2011; Campbell 2004).

More specifically, ideas and knowledge serve as a road map for actors in uncertain policy environments (Goldstein and Keohane 1993). They help policy makers define new policy problems and to determine which of many means will be used to reach desired goals. Moreover, they provide actors with strategies with which to achieve their policy objectives. In sum, ideas and knowledge guide behavior under conditions of uncertainty by delineating causal patterns or by providing compelling ethical or moral motivations for action (Sikkink 1991).

Ideas and knowledge also matter because they influence formation of institutions and are embedded in institutional arrangements (Hall 1993). Ideas and knowledge can serve as blueprints for designing organizations and institutions, the core elements for policy implementation. Furthermore, once they are institutionalized, ideas attract constituents who defend them if alternatives are suggested later (Thelen 2004; Pierson 2004, 2000, 1994). In other words, the implementation of policy based on specific ideas and knowledge may lead to long-lasting decision-making and institutional legacies that have more subtle, indirect, and self-reinforcing or path-dependent effects that constrain change later on (Campbell 2004).

Thus, policy ideas and knowledge strongly influence development and implementation of public policy and building government policy capacity – and they play a distinct role in policy in digitally mediated environments. They can change policy orientations and provide new perspectives on social phenomena. In addition, organizations and institutions for policy implementation will be designed differently in different central governments in accordance with systematically different ideas and knowledge. Consequently, modern states have tried to promote increased use of social knowledge for government policy making (Rueschemeyer and Skocpol 1996). On the one hand, modern states have tried to build strong government institutions concerned with producing their own policy knowledge, but on the other hand, modern states have vastly increased efforts to build institutions for importing social knowledge and have expanded their interactions with knowledge institutions in society including universities, think tanks, and professional groups.

Brokers play a key role in knowledge transfer. Ideas and knowledge for policy cannot be diffused and transferred to different sectors and policy areas automatically and smoothly (Meyer 2010; Pawlowski and Robey 2004). Contextual factors may prevent them from being diffused and transferred to other sectors. For example, knowledge produced in the private sector tends to be non-political, but the contexts of decision-making in the public sector, by definition, possess political characteristics. Thus, knowledge produced in the private sector is sometimes ill-suited for decision-making in the public sector. In addition, decentralization of decision-making and the biases produced through the professionalization of decision makers within organizations comprise other obstacles for knowledge transfer and diffusion. The more...
highly professionalized and decentralized organizations become, the more idiosyncratic the knowledge each organization requires for carrying out its functions (Hargadon 2002).

These impediments to knowledge transfer mean that actors who carry or mediate policy knowledge are required for knowledge transfer from one realm or sector to another. Actors who play such a role are called “knowledge brokers” and are defined as “individuals or organizations who provide connections between communities of practice, transfer elements of knowledge and practice from one community to another, enable coordination, and through these activities can create new opportunities for learning” (Wenger 1998: 109). In addition, these actors bridge different sectors and broker between different actors and organizations with respect to knowledge transfer. Through their brokering activities, different kinds of knowledge and ideas are linked and through various means transported from one ideational realm to another (Campbell 2004; Brown and Duguid 1998).

Restated, knowledge brokers perform the following activities (Meyer 2010; Feldman and Khademian 2007; Pawlowski and Robey 2004): First, they are carriers of knowledge. They participate in multiple communities and transfer knowledge and practices from one community to another. Second, they are translators of knowledge. Language is embedded in situated action, thus the meanings of particular words and forms of speech emerge continuously within, but not necessarily between, communities of practice (Wenger 1998). The process of translation involves framing the elements of one community’s worldview in terms of that of another community. Third, they are synthesizers of the knowledge. Brokers combine and synthesize various kinds of knowledge produced and adopted in diverse communities and create new knowledge and new alternatives for their own organizations.

Scholars have found various knowledge brokers in their research fields. Campbell (2004) names expert advisors, MBAs, consultants, think tanks, business and trade associations, and epistemic communities as examples of brokers. Sheingate (2003) argues that the U.S. President and Congressmen have played the roles of knowledge brokers in the U.S. political system. Cox (2001) pointed out that the members of welfare policy committees played the role of knowledge brokers in the welfare policy process in European countries. More broadly, knowledge brokering has been identified as one of the essential elements of leadership for promoting participation and economic development in local governments (Gibney 2011; Feldman and Khademian 2007).

Institutions are critical as mediators of knowledge transfer. The diffusion and transfer of knowledge are constrained by institutional arrangements. The extent of diffusion, its speed and the probability of adoption of new knowledge are affected by institutional arrangements (Skocpol and Rueschmeyer 1996). Moreover, the formal and informal institutional channels through which knowledge brokers gain access to decision makers mediate the effect that new programs have in influencing decision making and institutions (Hall 1989). In sum, the degree to which ideas and knowledge affect the policy depends upon how they are embedded in surrounding institutions in the first place.

One example is the difference in the adoption of New Public Management (NPM) ideas in the U.K., Canada, and France. The core NPM ideas were adopted most widely and radically in the U.K because the prime minister at the time, who possessed strong institutionalized power, took the initiative to promote NPM reform in the U.K. By contrast, NPM proposals were initiated by congressional actors in Canada and by the central bureaucracy in France. In these countries, NPM proposals were not supported by institutionalized sources of power in the course of their adoption and spread (Saint-Martin, 2004).

Institutions facilitate or constrain the activities of knowledge brokers. Pawlowski and Robey (2004) argue that decentralization promotes knowledge brokering because it requires organizations to conduct more activities for coordination. This demands more information and knowledge about different organizations
and their activities. Moreover, decentralized institutions allow knowledge brokers to behave more actively because institutional constraints on action are weaker in these contexts.

Finally, the question of who takes the role of knowledge broker is affected by institutional arrangements (Campbell 2004). In some states, for example, policy relevant knowledge comes primarily from an echelon of permanent civil servants who have a virtual monopoly on access both to official information and to the ultimate decision makers. In others, a new administration can bring in its own advisers and consult widely with outside experts (Saint-Martin, 2005).

THE BUSINESS REFERENCE MODEL IN THE UNITED STATES AND KOREA
iii
Definitions and Purpose
The BRM is one of the reference models of the Federal Enterprise Architecture (FEA)\textsuperscript{iv} framework, one of the e-government initiatives of the George W. Bush administration in February 2002. The development of the BRM in the U.S. and Korea relied on extensive development and use of PPPs, thus the BRM provides an important case for understanding the role of PPPs in e-government success.

The EA approach seeks to build coherence and strategic connections across people, business processes, organizational complexity and technology, in short, across the “enterprise.” According to the Institute for Enterprise Architecture Development, “Enterprise architecture frameworks consist of models intended to communicate, at a high level, the complexity and interdependencies of EA to a broad audience, while, at a low level, conveying requirements for complex system design (quoted in Fountain 2004).” The EA approach is viewed in many central governments as a key underlying factor for success in e-government because it provides a foundation for coherent investment, effective communication of innovations across agencies and ministries, and forms the foundation for architectures to support robust shared services.

The EA approach began in the 1980s with a comprehensive framework developed at IBM by John Zachman. Since its inception, the EA has been used by large companies including General Motors, Volkswagen AG, and Barclays Bank (Fountain 2004). This rapid adoption brought with it a rapidly growing consulting service market for EA in North America. Kennedy Information Inc. (2007), a market research firm focused on consulting services, found an acceleration in the number of projects to clean up -- that is, to make more consistent -- IT architecture and infrastructure and predicted that enterprise architecture would be the fastest growing market in North America increasing from $0.6 billion in 2005 to $1.1 billion in 2009 in the IT strategy and planning consulting marketplace.

What is the BRM as developed in U.S. federal e-government? It is part of a flexible architecture across the entire federal government meant to simplify service delivery by making it easier for agencies to collaborate across boundaries. Nested within enterprise architecture, it is defined as a “function-driven framework for describing the business operations of the federal government independent of the agencies that perform them and it provides an organized, hierarchical construct for describing the functions and day-to-day business operations of the federal government” (FEAPMO, 2002). The BRM describes the U.S. federal government’s “lines of business”, including operations and services for citizens independent of the agencies, bureaus and offices that perform them as illustrated in Figure 1 below. The first version of the BRM was made available by the Federal Enterprise Architecture Office in July 2002, and was subsequently revised and re-published in June 2003.

\textbf{Figure 1 The U.S. and Korean Business Reference Models}
The U.S. Office of Management and Budget noted in 2002 that the BRM is beneficial as a means for agencies to identify opportunities to simplify processes. Key areas for collaboration across agencies include financial management, human resources management, public health monitoring, and data and statistics. Moreover, by following the BRM, performance measures, government initiatives, and government agencies can be integrated as a single cross-agency initiative. For example, the U.S. federal government launched major cross-agency initiatives in grant processes, benefits processing, surplus sales, e-rulemaking, and other major administrative processes. These benefits of the BRM make it possible for government agencies to provide citizens and public officials with enhanced shared information services across agencies by reducing redundancies and streamlining processes. By describing the federal government in terms of common business areas instead of taking a stove-piped, agency-by-agency view, the BRM promotes agency collaboration, data sharing and integrative services for citizens.

The conceptual example, illustrated in Figure 2, shows how a number of agencies related to the Border Control Initiative can categorize their data and collaborate in providing shared services and data sharing. The business reference model allows the agencies related to the initiative to easily identify by business process the “right” other agencies with whom to collaborate. Moreover, because the BRM is linked with the data reference model, a dictionary of sorts describing the data and information that support program and business line operations, agencies can easily find the data that they need to carry out their programs in other agencies. Consequently, the development of shared models of business processes and shared data dictionaries across agencies is meant to promote data sharing and shared information services among government agencies.
The Federal Enterprise Architecture approach, including the BRM, developed during the George W. Bush administration was benchmarked by the members of the administration of South Korean President Roh Moo-hyun as a template to develop a Korean BRM and ‘Governmental Information Technology Architecture (GITA),’ a Korean version of the FEA framework. The Korean BRM was officially selected as one of the ‘core’ e-government initiatives of the Roh administration in August 2003. Like the U.S. model, developers surveyed, categorized, and linked the functions of government agencies and collected feedback from agencies from August 2004 to November 2005. By October 2005, the BRM was used as a reference model for the government’s IT architecture and was integrated into government-wide shared applications as the government’s common categorization of administrative functions (PCGID, 2005: 205-211).

Early in the Roh administration, there were criticisms and concerns about redundancies in IT investments and the low efficacy of e-government systems in providing citizen-centric services and enhancing government performance. E-government systems built in a stove-piped manner with a low level of information sharing between e-government agencies were viewed as major causes of these problems. In seeking a way to redress these deficiencies, the Korean government viewed the U.S. enterprise architecture approach as a useful model, and the BRM was selected as one of the core e-government projects of the Roh administration (PCGID 2005: 205-211).
For these reasons, the definition and purpose of the Korean BRM were similar to its U.S. counterpart. The Korean BRM was defined as “a government-wide functional map independent of government agencies for providing citizen-centric public services, driving government innovation and enhancing the effectiveness and efficiency of e-government” (PCGID 2005: 205-211). The purpose of the Korean BRM was: (1) to promote government reform by identifying opportunities to simplify processes and to enhance the level of collaboration across agencies; (2) to reduce the redundancy of IT investments; and (3) to promote information-sharing and integrative information services for citizens with information systems linkage across agencies (MoGAHA 2007a).

**Differences Between the U.S. and Korean Business Reference Models**

Although both initiatives began with similar goals, and Korean policy makers followed the U.S. BRM model, project outcomes differed between the two governments. In terms of structure, the U.S. business reference model has a function-oriented structure, independent of federal agencies, as illustrated in Figure 1. The current U.S. BRM has a three-tiered hierarchical structure, consisting of four business areas, 39 lines of business, and 153 sub-functions (FEAPMO 2003).

The Korean model, however, has an organization-oriented structure because the root category of the Korean BRM is the ‘Ministry’. Furthermore, the levels of functions follow the organizational structure of the ministry. That is, the second-level of the Korean BRM consists of functions carried out by bureaus and offices, the higher-level organizations within a ministry. The third-level pertains to the functions of divisions, which represent lower-level organizations in a ministry (MoGAHA 2007b). Thus, when the initial organization in Korea was completed in August 2008, under these principles of functional categorization, the Korean BRM has a three-level hierarchical structure, containing 15 first-level functions, 67 second-level functions, and 491 third-level functions. The primary purpose of an enterprise approach, that is, to bring consistency and to reduce redundancy across ministries and programs was explicitly omitted from the Korean business reference model.

These differences between the core organizational structure in the U.S. and Korean BRMs led to a divergence in results and evaluations in the two governments. In the U.S. federal government, redundant IT initiatives could be identified and the level of information sharing among federal agencies was enhanced by using the BRM. For example, the U.S. Office of Management and Budget found that information systems which the Department of Education had tried to build provided services similar to those of the Grant.gov system, a government-wide IT system developed during the Bush administration following adoption of the BRM. As a result, OMB refused to allocate resources for the Department of Education system (OMB, 2002). Similarly, the Departments of Labor, Housing and Urban Development, and Education discovered through their use of the BRM that they provided similar job training programs for the unemployed. As a consequence, the three departments began to share information among themselves and coordinated the programs of each agency (Rocheleau, 2006: 148-155).

By contrast, the Korean design of the BRM limited the potential to develop government-wide management systems and thus did not provide the expected benefits. According to research conducted by the Korean Institute of Public Administration (KIPA) (2007: 123), a national think tank in public administration and policy, agency administrators were prevented from finding similar programs to collaborate with and from linking together government-wide programs and functions because the BRM had an organization-centric structure. In addition, the BRM was of little use in enhancing levels of information sharing due to its organization-centric structure. In brief, it was difficult for users to identify the functions and organizations in which information sharing was required for better performance and higher efficiency from use of the BRM. For these reasons, public officials in e-government doubted the usefulness of the BRM. As a consequence, the Korean BRM has seldom been used in the Korean government.
PUBLIC-PRIVATE PARTNERSHIPS AND THE BRM

Developments in the United States Federal Government

The Office of E-Government and IT (OEG), located within the U.S. Office of Management and Budget, assumed a leadership role for e-government building during the Bush administration as mandated by the E-Government Act of 2002 (EGA: Public Law 107-347) which prescribes the formal roles of federal agencies, resources, and their accountability for e-government building. The Act states that the OEG shall assist the Director of the OMB:

in carrying out (1) all functions of management and promotion of e-government services; (2) all of the functions assigned to the Director under federal management and promotion of electronic government services; and (3) other electronic government initiatives, consistent with other statutes. ix

The E-Government Office institutionalized the following linkages with private partners. Inside OMB, contractors, consultants from major consulting firms, were hired to support e-government decision makers. ix The consultants were all professionals with extensive expertise in IT, and many had MBA degrees. They supported “everything in the Office” directly and constantly with offices in neighboring rooms in order to maintain “symbiotic relations” with the government staff. xi Some contractor groups carried out specific projects related to e-government programs, others supported high-ranking public officials with carrying out relatively general tasks such as gathering perspectives on e-government policy from diverse stakeholders, making and analyzing policy alternatives, providing statistics related to e-government initiatives and joining decision-making meetings.

For example, Tim Wang worked for the Office as a supporting contractor. He won an award as one of the ‘2007 Federal 100 Winners’ from Federal Computer Week, a business newspaper, for his contributions to e-government development. The award focused on his critical role in the Office: “Tim Wang, principal consultant at SRA Touchstone Consulting Group, provided exceptional contractor support and continuity to the Office of Management and Budget's Office of E-Government and Information Technology during a time of high turnover among key portfolio managers. Wang has worked at OMB since 2003, when the e-government initiatives were new, and he has gathered a wide range of perspectives. Although the [portfolio] manager positions were empty, Wang attended all portfolio meetings so that he could relay important issues to senior OMB officials to keep the office running smoothly. Wang also volunteered his expertise to OMB officials who were updating OMB Circular A-11 to improve the federal budgeting process. (Circular A-11 is the primary guidance to federal agencies on the preparation, submission and execution of the U.S. federal budget.) Wang's efforts helped organize an annual flood of information from departments and agencies. Although contractors do as they are told, "consultants do that and then some," said Tim Young, associate administrator for e-government and IT at OMB.” From the above, we get hints about the concrete activities of supporting contractors and the organizational mood of the Office. xii

Outside the U.S. government, the Industry Advisory Council (IAC) has supported the E-Government Office. The IAC is a non-profit organization of about 400 IT companies. Its goal is to share professional experiences and information in order to promote communication, and increase the degree of trust in IT among public officials and entrepreneurs in the IT field. xiii The IAC provides its perspectives on “best practice” for IT adoption and IT governance in the private sector and research results, often business research, on e-government initiatives. Through its formation of Shared Interest Groups (SIGs), it has encouraged the consultants and researchers of private IT companies to draft working papers on e-government policy on topics of short- and long-term importance such as modification of IT adoption in the private sector, strategy and governance structures for e-government policy, and stakeholder and
constituent reactions to current issues of e-government policy. These working papers are delivered to decision-makers in the Office of E-Government and IT and often referred to in the policy process.\textsuperscript{xiv}

These two groups, supporting contractors and the IAC, were networked during the Bush Administration. For example, the consulting firms of the supporting contractors joined the IAC and actively participated in the Enterprise Architecture (EA) SIG, a research group focused on federal enterprise architecture formed by the IAC. In this group, supporting contractors and IAC member researchers had opportunities to discuss e-government initiatives and the FEA.\textsuperscript{v} Furthermore, some of the U.S. Office of E-Government professional staff had previously worked for IT companies. For example, Mark Forman, the first Office of E-Government administrator, had previously worked for IBM, and Tim Young, an associate administrator, had previously worked for the Office of E-Government as a supporting contractor.

From the planning stage to adoption, supporting contractors were actively engaged in each stage of the development process.\textsuperscript{xvi} First, they raised awareness of the necessity of the BRM. While they supported the OMB task force team whose main job was to make e-government strategy, supporting contractors argued that building “cross-agency” enterprise architecture would be one solution for the problems that U.S. e-government was facing at that time.

Second, supporting contractors contributed to development of a pilot BRM named ‘An Integrated Government-wide Business Architecture’ (OMB 2002). This model was used by the task force to find linkages between agencies’ functions and redundant IT investments in the federal government. For building the pilot BRM and making e-government strategy, supporting contractors adopted a modern e-strategy approach, a commercial practice.\textsuperscript{xxiii} In addition, they carried out an analysis of functions and of the status of IT in federal agencies, conducted surveys on the opinions of interested parties, developed a performance index of e-government initiatives, and provided policy alternatives, among other activities.

Third, private sector experts were involved in implementing the BRM projects and developed implementation strategies and feedback systems to enhance feasibility and institutionalization. They aided decision makers in OMB’s E-Government Office by surveying public managers for their various perspectives on the BRM, finding solutions to problems, and monitoring the status of BRM development and implementation. They also supported establishment of guidelines for using the business reference model and federal enterprise architecture and provided federal agencies with case studies on BRM and FEA usage. In addition, they carried out projects for calculating the return on investment of the FEA initiatives.

They also joined in the development of the BRM and the FEA projects in other ways. For example, Booz Allen Hamilton carried out the projects for producing the following guidance documents: “Five Interrelated Reference Models to Facilitate Collaboration and Communication”; “Detailed guidance to help federal agencies comply with FEA requirements included in OMB Circular A-11”; and “The FEA Management System (FEAMS), an Internet-based EA tool to aid FEA analysis, maintenance, planning, and architecture development”.\textsuperscript{xxviii}

The Industry Advisory Council was asked to research the FEA and the BRM by the OMB because large U.S. IT firms had accumulated knowledge over several years about the EA, in part through their experience in solving IT management challenges such as those that stemmed from Y2K.\textsuperscript{xxv} To conduct the requested research the IAC formed the enterprise architecture special interest group in which more than 100 IT companies participated. Its ultimate goal was “to help government leaders develop approaches to address the challenges they face in delivering quality products and services to citizens.” The EA SIG was meant to provide an objective, vendor-neutral and ethical forum to address enterprise architecture issues of common interest to government and industry.\textsuperscript{xx} As previously noted, the working papers produced by the EA SIG which contained their research findings were delivered to the OMB and referred to in
building the government’s business reference model and its federal enterprise architecture. The Industry Advisory Council also conducted research about implementing the BRM projects and developed implementation strategies and feedback systems. For example, the E-Government Office was provided with working papers outlining solutions to technical problems such as the linkage between the BRM and the budget process following the revision of OMB Circular A-11. The Industry Council’s enterprise architecture group also created prototypes for the ‘Enterprise Architecture Assessment Framework’ for the E-Government Office.xxi

Developments in the Government of Korea
Since the Korean government started building e-government systems in earnest in the early 1990s, several laws have been enacted regarding the construction of e-government systems, with different rules giving authority for e-government promotion to different ministries (Yoo & Yoon, 2005; Phang, 2002). To resolve the conflicts that ensued from multiple jurisdictions exercising authority over e-government, the Korean government amended the Government Organization Act in 2004, adjusting government agency functions and authorities over e-government promotion. As a result of the amendments, the Korean Ministry of Government Administration and Home Affairs (MoGAHA) was put in charge of e-government promotion. Consequently, the MoGAHA was able to wield primary power for managing the development of the business reference model for the Korean government.

Many IT vendors and consulting firms joined in the process of e-government system implementation in Korea. The Korean government outsourced IT system implementation and maintenance projects to IT vendors and gave consulting firms opportunities to be involved in projects for developing government-wide information strategies and business process reengineering projects for public agencies. Similar to the U.S cases, IT vendors were involved in the IT/IS projects through contracts with public agencies which begin with a request for proposals and rigorously monitored bidding and selection processes.

However, IT vendor roles were limited to system implementation so they did not develop ongoing working relations with IT policymakers in government. Instead, the National Computerization Agency (NCA),xxi a major quasi-autonomous non-governmental organization (quango, hereafter) played this role. The NCA researchers and IT professionals supported the decision-makers in government and mediated between the government and the private sector. The NCA supported policy-makers by providing them with related knowledge and by suggesting policy options (NIA 2007). The NCA was established in 1987 as statutory agency founded through the enactment of the Act on Expansion of Dissemination and Promotion of Utilization of Information System. Under its legal framework, the NCA was controlled by the government authorities concerned, but its employees were not public officials.

At the initial stage, the NCA was established as a technology-oriented agency. Its primary mission was developing auditing guidelines and performing audits for the National Administrative Information System, promoting standardization of IT/IS, and providing technological supports for public agencies. However, as demands for promoting informatization increased, its mission expanded to include provision of expertise in promoting informatization in Korea by developing and implementing the National Framework Plans on Informatization Promotion and the e-Government Promotion Plans, managing and operating information networks of public organizations, supporting information resource management in the public sector, and managing e-government and IT initiatives, and related activities xxiii

For carrying out these complex tasks, well-educated professionals have worked for the Agency. As of 2003, about 14 percent of total employees of the NCA had a Ph.D degree and about 51 percent held a masters degree as shown in Table 1 below. In addition, the NCA maintained an IT professional pooling system for getting advice and IT knowledge. About 300 professionals were registered in the pooling system as of 2005 (Yoo and Yoon 2005).
Table 1  Education Level of NCA Employees as of 2003

<table>
<thead>
<tr>
<th>Degree</th>
<th>Ph.D.</th>
<th>Master</th>
<th>B.A.</th>
<th>Non-Degree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field</td>
<td>Humanities</td>
<td>Humanities</td>
<td>Humanities</td>
<td>Humanities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; Social</td>
<td>&amp; Social</td>
<td>&amp; Social</td>
<td>&amp; Social</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>Engineering</td>
<td>Science</td>
<td>Engineering</td>
<td></td>
</tr>
<tr>
<td>Number of</td>
<td>Employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>13</td>
<td>50</td>
<td>67</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>117</td>
<td>68</td>
<td></td>
<td>230</td>
</tr>
<tr>
<td>Percentage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(%)</td>
<td>13.9</td>
<td>50.9</td>
<td>29.6</td>
<td>5.6</td>
<td>100.0</td>
</tr>
</tbody>
</table>

(Source: NCA)

From the planning to the adoption stage of the Korean BRM, the NCA was actively engaged in the process. First, the agency proposed that the business reference model and the GITA, the Korean version of the federal enterprise architecture, should be adopted to overcome a variety of problems which had stemmed from the stove-piped structure of early Korean e-government efforts, including IT investment redundancy and low levels of IT system effectiveness. Against this backdrop, the BRM and the FEA were proposed as tools for building cross-agency e-government and upgrading information services for citizens by the NCA.

Second, the NCA tried to produce and share knowledge of the business reference model with government agencies. Specifically, an NCA research department translated U.S. government reports on the BRM and the FEA. They delivered those translations to their public partners to be referred to for development of related policies (NIA, 2003a; 2003b). In addition, the NCA held several conferences about the BRM and the EA and created “the ITA/EA Forum” where government officials, IT vendors and enterprise architecture experts from the NCA could discuss how to build the business reference model and enterprise architecture for Korean government. In these conferences and forums, private firms presented their best practices and the experiences of IT vendors and consulting firms were shared among participants.

Third, the National Computer Agency developed a pilot BRM, again referring to its U.S. counterpart as a model. The goals of the pilot project were to surface expected problems and the unanticipated effects of adopting the U.S. BRM in advance and to examine what dimensions of the U.S. BRM should be modified to enhance its feasibility for Korean government (NIA, 2003a; 2003b). These NCA activities were conducted in cooperation with specialists in IT firms. In fact, the pilot project’s task force team was composed of NCA researchers and IT company consultants.

Fourth, NCA researchers were involved in implementing the BRM projects and developed implementation strategies and feedback systems. They made mid- and long-term plans for developing and adopting the EA, established guidelines for adopting the ITA in public agencies, and set standards for enterprise architecture frameworks. In addition, they contributed to opening ITA training programs for
public officials. The NCA also was involved in managing business reference model projects such as writing and disseminating requests for proposals for the projects, developing contracts with companies, and managing the procedures for the projects.

**The U.S. and Korean Cases Compared**

Several similarities between the two cases can be identified. From the macro perspective, case analysis results show that both governments had a structure for IT knowledge transfer that included extensive use of PPPs. Through the PPPs, both governments learned from non-governmental organizations about the business reference model. Key actors in both governments adopted and adapted policies, practices and knowledge from non-governmental sectors. Both cases provide support for research on the extensiveness and importance of PPPs for knowledge transfer and policymaking in modern governments.

From the micro perspective, the case studies indicate that private sector actors were involved in actually building the BRM and carried out similar activities in terms of knowledge transfer in both governments. Specifically, private partners performed the following tasks: (1) raising awareness of the necessity of the BRM in order to develop shared services for the public good; (2) providing best practices from private firms and methods for adopting these practices to government; (3) developing pilot BRM projects for the governments and evaluating their effectiveness; and (4) developing implementation strategies and feedback systems to enhance feasibility and institutionalization.

Private partners in both countries played roles as “knowledge brokers” in the BRM building process. They carried knowledge about business reference models from the private to the public sector in the form of best practices, implementation strategies for BRM adoption and design of feedback mechanisms. Moreover, they provided their own tacit knowledge, which they had gained from working on similar projects in the private sector.

However, they did not transfer knowledge across sectors without revisions. Private partners in both countries translated knowledge in the course of transferring it from one realm to another. In the U.S., for example, private partners tried to embed the BRM into the budget process by revising OMB’s Circular A-11, its primary guidance to agencies on budget preparation, because they understood that the budget is the most powerful method for requiring new activities in the public sector. In Korea, NCA researchers paid close attention to the differences between the U.S. federal government and the Korean government. They were careful to examine whether the U.S. business reference model could be successfully adopted in the Korean government. Lastly, private partners in their knowledge brokerage role were synthesizers. Combining several kinds of knowledge and information, they produced the BRM and measures for implementing it. In turn, these activities became sources for other knowledge concerning the BRM and government IT.

Our case analysis also finds that the two countries took entirely different approaches to working with non-governmental organizations in building the BRM. The U.S. federal government embedded private and non-profit actors deeply within the central e-government decision-making structures of federal agencies and OMB to enable rapid knowledge transfer. But in Korea, the roles of IT vendors and consultants were limited to system implementation. Instead, the NCA, one of Korea’s quangos in IT policy, was deeply engaged in building the BRM.

What accounts for this difference between the two cases? One explanation stems from differences in the historical development of IT policy in the two governments. In the U.S., after the 1970s the federal government began to fall rapidly behind the private sector in using computing and managing information resources although it had been regarded as a leader and innovator in computer usage in earlier stages of computing (Head, 1982; OTA, 1981, quoted in Margetts (1999)). This widening gap between public and private use of IT caused political concern, and federal agencies were criticized for not using more
contemporary IT. These concerns and criticisms led to expanding IT expenditures in federal agencies and brought IT companies and consulting firms to government IT projects (Margetts, 1999).

By contrast, in Korea informatization started in a different context in the early 1980s. National informatization was led by the central government because political elites at that time believed that the IT industry should be grown to promote economic growth. Therefore, government started early to establish a governance structure for IT policy, to make major investments in IT research and development, and to strongly subsidize IT companies in order to promote the Korean IT industry. Government began to expand government IT systems not only to make government more efficient but also to increase demand for Korean IT products and services.

In the course of this government-led informatization strategy, many quangos were established and were delegated authority for IT development and regulations over business and civil society. The quangos provided the Korean government with the ability to implement public policy effectively and efficiently. The quangos participated in program implementation with the delegated authorities for IT promotion and regulation. For business, they played the role of mediators by aggregating opinions about IT policy from business and delivering them to the appropriate authorities in government. In the IT policy field alone, 72 quangos had been established as of 1994, the NCA being one of them (Jung 1997).

Another difference between the U.S and Korean cases relates to project outcomes, specifically related to the structure of the BRM in each country. As previously noted, the U.S. business reference model has a function-oriented structure, but the Korean model has an organization-oriented structure. This fundamental and highly consequential difference in structures came about although the knowledge brokers in both countries provided virtually the same ideas and knowledge, namely a BRM model with a function-oriented structure. What accounts for this difference between the two models? The answer may be traced to key differences in the institutional contexts in which the knowledge was diffused and in which adoption took place. Specifically, the Office of E-Government in the U.S. exerted strong and broad authority for e-government building through the mandate of the E-Government Act and had at its disposal several vehicles and tools for coordination.

For example, the E-Government Office, located within the U.S. Office of Management and Budget which is the largest entity in the Executive Office of the President, used budgetary power, working in collaboration with the budgetary units of OMB and its authority to administer the e-Government Fund. In addition, the Office of E-Government used evaluation frameworks and persuasion through government-wide bodies such as the CIO Council, a decision-making body comprised of agency chief information officers. This varied institutional structure for e-government promotion empowered the U.S. Office of E-Government to adopt and implement the idea of the function-oriented BRM and to overcome conflicts and criticisms of the BRM from federal agency decision makers. Although implementation was by no means rapid, easy or simple, the institutional mechanisms and authorities developed within OMB through the Office of E-Government made possible far-reaching changes in the course of e-government, specifically in shared services, in the U.S. federal government.

By contrast, the implementation of the Korean BRM suffered from fragmented authority, ineffective managerial tools, and conflict among agencies. There was a “turf war” among the public authorities with jurisdiction over e-government promotion. In the course of resolving the conflict, the Special Committee, the initial adopter of the idea of “a cross-agency BRM,” lost the power and authority for promoting e-government. In addition, the leaders of the MoGAHA, a public partner that came to power in a later stage of the BRM initiative, did not understand the cross-agency concept or its benefits and did not have the authority or vehicles to control and coordinate implementation of a function-oriented BRM. Consequently, the Korean government had no choice but to abandon its original plan for a function-oriented system, and produced a much weaker, less effective organization-oriented form of BRM.
Thus, this study shows that the ideas and activities of knowledge brokers and private partners working through PPPs are insufficient to ensure the realization of even well-established business model ideas in government. Building appropriate institutional arrangements to support realization of ideas and knowledge across sectoral boundaries must accompany knowledge brokering (Eom, 2012). The study demonstrates the not only the importance but also the limitations of knowledge brokering and knowledge transfer in PPPs when government institutions are not structured to absorb and implement new models. The comparative case study suggests that when agency or ministry autonomy is threatened by integrative IT systems that governments must use powerful institutional means, including the budget process, to effect change. These findings, although suggestive, offer important lessons for research and practice concerning e-government success.

Solutions and Recommendations

How do governments develop public-private partnerships to enhance and accelerate learning about and development of new capacity? How do governments adopt and adapt policies, practices and knowledge from non-governmental sectors to enhance e-government success? To shed light on these questions, the authors analyzed the concrete activities of private partners in the development of the business reference model, a key component of enterprise architecture and shared services, in the central governments of the U.S. and Korea.

The results indicate that private sector partners in both nations played roles as “brokers” of IT knowledge between the government and private sector, primarily performing the following tasks: (1) raising awareness of the necessity of the BRM; (2) providing best practices from private firms and the best methods for adopting the practices to government; (3) developing pilot BRM projects and evaluating their effectiveness; and (4) developing implementation strategies and feedback systems to enhance feasibility. More broadly, both governments learned from non-governmental organizations about the BRM. That is, PPPs have been institutionalized as a channel for knowledge transfer between government, civil society and business in both nations.

However, we also find important dissimilarities between the two cases. Two countries took entirely different approaches to working with non-governmental organizations in building the BRM. In the U.S., IT consulting firms and a non-profit organization of IT companies, the ICA, played the roles of knowledge brokers. In Korea, by contrast, the NCA, one of several quasi-governmental organizations in IT policy, was deeply engaged in building the BRM and acted as an intermediary between the government and private sectors. The study finds that the institutional arrangements in which PPPs are embedded strongly influence the outcome of e-government projects when the projects pose a perceived conflict between the interests of agencies or ministries and the government as a whole. Institutional arrangements influence the outcomes of knowledge transfer.

This study indicates that the roles of private experts are markedly greater when and where they serve the knowledge needs of other powerful actors and policy decision makers in modern governments, especially in the IT policy field. We recommend that governments analyze the level and type of relationships involved in their knowledge transfer strategies. Yet another important finding of this study is that history and institutions matter. We recommend that government decision makers examine the institutional arrangements for e-government to identify sources and limitations of power and authority to successfully transfer appropriate knowledge from the private sector and to implement e-government projects. This study shows that differences of institutional context where the same knowledge was transferred had an influence on producing different outcomes of the BRM projects. And the different historical backgrounds...
of IT policy and informatization in the two governments offer partial explanations for the different institutions of the PPPs.

FUTURE RESEARCH DIRECTIONS
This study suggests the importance of studying PPPs and knowledge transfer in their institutional context. With respect to e-government success, the institutional arrangements and mechanisms that government decision makers develop have important consequences for the ability of decision makers to adopt and adapt new ideas and knowledge across sectors. The wide variation in project success in e-government invites a closer examination of the institutional arrangements by which governments incorporate new ideas and implement e-government projects. The results of the present study should be considered suggestive. In this study predictive theory was not tested. Rather, a more exploratory approach drawing from rich veins of theory and research on PPPs and knowledge transfer was used to inform comparison of two case studies that examined factors that influence e-government success. There is a great disparity between the two political economies compared in this study in terms of the institutional characteristics of the governments in which the BRMs are embedded. Future research might include development of case studies based in a variety of political economies selected on variables that would allow for continued and refined comparative analysis. Second, statistical testing or large-N case study design should be considered for future research to test the external validity of some of the claims introduced here. Future research directions might include construction of variables that might be operationalized for quantitative study. Finally, the business reference model, our empirical referent, tends to be examined statically. Future research might consider the dynamic nature and needs of such reference models over time.

Research directly related to practitioners might also useful extend and further develop some of the insights drawn from the present study. In this regard, close examination of key actors and their relationships across sectors in the course of formulation and implementation of complex e-government projects would generate recommendations for practice.

CONCLUSION
This comparative study extends the typical views of public-private partnerships beyond a focus on contractual relationships to examine knowledge sharing and the transmission of practices and policies from the private to the public sector. It deepens our understanding of public-private partnerships, a key element of e-government success, by examining at close range knowledge transfer across the nodes of multi-sectoral networks. From a comparative perspective, the cases describe and explain different structures for public-private partnership and their embeddedness in distinct institutional contexts holding constant the policy area. The results have important implications for development of shared services in e-government.

REFERENCES


Organizational complexity and technology.

Enterprise architecture: An approach to architecture meant to convey requirements for complex system design highlighting interdependencies across entities and connections among people, business processes, organizational complexity and technology.
Federal enterprise architecture: Encompasses five reference models including performance, business, service component, data and technology and designed as a planning and management tool to guide federal information technology investments and focused on identification of common applications across government that can be used to reduce duplication and overlap and thereby improve efficiency.

Knowledge brokers: Individuals or organizations that connect communities of practice, transfer knowledge and facilitate coordination.

Non-governmental organization: Includes private and nonprofit sector organizations.

Public-private partnerships: Organizational arrangements with a sector-crossing or sector-blurring character. Combinations of government resources with those of private agents encompassing the range of cooperation among actors from public and private sectors.

NOTES

i We define “non-governmental organizations” to include private and nonprofit sector organizations.

ii The public leverage is a kind of PPP where governments use their legal and financial resources to create conditions that they believe will be conducive to economic activity and business growth when government wishes business or not-for-profits to be the means of realizing a goal that might otherwise be achieved through public bureaucracies (Skelcher 2008).

iii This section is based on Eom (2012).

iv The FEA, which has five reference models, performance, business, service component, data, and technical, is a planning and management tool used to guide federal information technology investments, with a specific focus on improving efficiency and identifying common applications that can be used government-wide (Seifert, 2006). Retrieved from http:www.feapmo.gov/feahistory.asp, last accessed March 10, 2008.

v The FEA reference models can be easily integrated along business lines, providing a foundation for the Component-Based Architecture design. Therefore, “The BRM serves as the foundation for the FEA” (FEAPMO 2003).

vi Ministries of the Korean government consist of several ‘bureaus’ or ‘offices’. In turn, there are several ‘divisions’ in a bureau or office. Thus, ministries, bureaus or offices, and divisions are hierarchically aligned in the organizational system of the Korean government.

vii From an interview with the consultant who participated in the government-wide information sharing project of the Roh administration on September 15, 2009.

viii From an interview with current civil servant who engaged in e-government policy formulation of current Lee administration on June 11, 2010.


x Major supporting contractors in the field of e-government were Booz Allen Hamilton and SRA International. From the interview with the consultants supporting the OMB on July 12, 2007.

xi From the interview with the consultant supporting the OMB on July 10 and 12, 2007 and the interview with then Federal Chief Architect of the OMB on July 10, 2007.


xiv Interview with the chairman of the IAC, July 13, 2007.

xv Interview with the chairman of the IAC, July 13, 2007.

xvi Interviews with a supporting consultant to OMB, July 10 and 12, 2007.

xvii Interview with Mark Forman conducted by IBM Center for Business of Government, May 30, 2002.

Interview with the Chairman of IAC on July 13, 2007.


The name of the NCA was changed to the National Information Society Agency (NIA) in 2006.

More specifically, the NCA was designated as the exclusive organization for: (1) constructing the Korea Information Infrastructure (KII) in 1994; (2) supporting specialized technologies for national informatization in 1996; (3) supporting e-government technology in 2001; and (4) supporting e-government projects in 2004. In addition, the NCA launched e-approval certification services in the public sector in 2001 and constructed the backup center for National Backbone information System in 2002 (NIA 2007).

For example, the former president of the NCA, Dr. Sam-Young Seo, maintained that the BRM and the GITA should be built for these reasons in his speeches in many IT forums (Seo 2004).

Interviews with consultants on December 13, 2007 and the NCA researchers who participated in the pilot project on February 20, 2008.