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Examining Public-Public and Public-Private Partnership of Information Systems in Taiwan

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Abstract

Government agencies have spent lots of money on information system (IS) deployment. However, the partnerships, i.e. public-public partnership (PUP) and public-private partnership (PPP), are less explored in IS domain. Under the concept of social exchange, this study used electronic document management systems (EDMS) in Taiwan government as the target IS for examining the PUP and PPP among agencies and vendors. This study develops a theoretical model that is informed by the literature on partnership and by social exchange theory to explain the aggregated implementation of EDMS. Based on previous literature, this study suggests that the performance expectation is the incentive and affects the support from top-management, trust to others and regulation power from National Archives Administration (NAA) that shape the PUP and PPP in government agencies. To propose the empirical findings, this study collects data from agencies with digital signature used in EDMS. This study establishes the adaption of EDMS in agencies, infers the managerial implication, and compares the findings with other researches to enhance its contribution. Support from top manages and trust to others positively affect the PUP and PPP. The results of the mapping can help identify the research direction of PUP and PPP research.

Keywords: Public-public partnership, Public-private partnership, Electronic Document Management Systems, Social exchange theory

INTRODUCTION

In 21st century learning, the partnership established information literacy as a fundamental component of success in the global economy (Bendriss, Saliba and Birch, 2015). Government agencies embrace all relevant stakeholders in the network for the development or implementation of a policy program (Steijn, Klijn and Edelenbos, 2011). One of the most widely recognized types of collaboration is partnership (Huxham and Vangen, 1996). Partnership can be defined as a “pooling or sharing of resources among two or more stakeholders to solve a problem or create an opportunity that neither can address individually” (Selin and Chavez, 1995). In this way partnership, when operating effectively, can provide a synergy whereby the whole is greater than the sum of its parts. Public-public partnership (PUP) has received increasing attention in recent years as an alternative approach which could improve the performance of struggling utilities. PUP is not for profit and includes both twinning capacity building arrangements and operational partnerships where government-owned providers work with trade unions, communities or other non-profit groups to deliver services. At their core is a spirit of public service and solidarity. PUP is gaining in international recognition and support. A key difference is that public-private partnership (PPP) involves take-over of management of services; PUP may do this in some cases, but are generally more focused on enabling better services (Tucker, Calow, Nickel, and Thaler, 2010). There spends lots of information system (IS) budget in public sector in many countries. However, the partnerships, i.e. PUP and PPP, are less explored in IS domain (Greasley, Watson and Patel, 2008). The phenomenon and generalizability of partnership in government are deserving to be undertaken and investigated.

A great advantage of PUP is that they avoid the risks of such partnerships: transaction costs, contract failure, renegotiation, the complexities of regulation, commercial opportunism, monopoly pricing, commercial secrecy, currency risk, and lack of public legitimacy. PUP is not merely an abstract concept. There exist over 130 PUPs in around 70 countries. These PUPs cover a period of over 20 years, and been used in all regions of the world. Many of the PUP projects have been initiated in the last few years, a result of the growing recognition of PUP as a tool for achieving improvements in public water management (Hall, Lobina, Corral, Hoedeman, Terhorst, Pigeon, and Kishimoto, 2009).

Successful partnerships have typically received some form of external support. The clearest benefit of PPPs seems to be efficiency gains and some technical improvements in performance particularly increasing production and service hours. Various countries have introduced PPP to gain operational efficiency, innovative skills, and technological expertise from the private sector to achieve active involvement of private players in public services (Chowdhury, Chen and Tiong, 2011). On the public sector side, there are public authorities creating and implementing PPP policies as well as actually procuring the systems. On the private sector side, companies provide construction and operational services. Structuring PPP is quite complex because of the need to reconcile the interests of a large number of parties involved and relationship among them (Yescombe, 2007). Government agencies may not get acquainted with new information technology such digital signature. Therefore, they need the suggestions from vendors.

In the era of information society, government agencies often organize their services and operations into programs that may be changed in response to a host of factors, including IS implementations (Walker, 2001). Information systems have been shown to be important for government administration among different agencies or functional areas (Chen, Chen, Huang & Ching, 2006). Since the late 1990s, governments at all levels have launched e-government systems with the objective of providing quality electronic information and services to citizens and businesses (Torres et al., 2005). New technologies in the government sector have not only helped to improve service delivery and increase democratization (West, 2004), but have also helped to enhance transparency as well as increase national business competitiveness (Srivastava and Teo, 2010). Social exchange occurs when participants are mutually dependent on each other for valued outcomes (Molm et al., 2000). Social exchange theory (SET) has been outlined as a valuable analytical framework in exploring collaborative alliances (Kolk et al., 2010; Muthusamy and White, 2005). Through various media, past activities of government are preserved as critical memory in agencies after filing. Digital documents are stored in IS and digital media while paper ones are cataloged by IS (Kohli and Grover, 2008). Electronic documents management systems (EDMS) are then created to fulfill the regulation of related rules. This study used EDMS in Taiwan government as the target IS for examining the PUP and PPP among agencies and vendors. Therefore, under the concept of social exchange, the aim of this research is to explore the factors which affect the PUP and PPP regarding the EDMS in government agencies.

LITERATURE REVIEW AND HYPOTHESIS

Partnership brings not only the advantages of both public and private sector skills and knowledge to the provision of public services, but also additional sources of information and solutions, social capital and potentially less formal control and fewer costs incurred in competition. Klijn and Teisman (2003) suggest that contracting becomes a means by which to mediate the complexity of relationships that are necessary to make these ventures work. In considering a different type of partnership, Johnson and Osborne (2003) confirm the difficulty of holding partners together in the delivery of specified outcomes in complex situations. They illustrate that governments are reluctant to let go of control, despite their rhetoric of co-governance. If these two articles both illustrate the difficulty of holding collaborations together in complex projects, contracting is shown to provide one approach to solving this problem. All the articles raise questions about the use of PUPs and PPPs and the manner in which they are both justified and managed. Together they provide ample evidence to remind us that partnerships are no panacea, for they bring their own technical, organizational and political challenges. Yet the evidence also confirms that in appropriate circumstances partnerships may indeed realize those gains outlined above. As in so much of today's public service management, the challenge lies first in recognizing those circumstances.

The literature on partnership and IS provide the theoretical basis of this study for studying adoption of EDMS in government. First, the findings from previous research on PUP and PPP shed light on some salient beliefs worthy of consideration to augment partnership for IS adoption in government agencies. Second, prior research on social exchange theory has provided a basis for identifying and classifying antecedent variables that are relevant to the outcomes of EDMS in government agencies. The implementation strategy is particularly important in preparing EDMS for regulation rules, for example, fulfilling the Documents and Records Computerization Guide launched by National Archives Administration (NAA) for regulating the design and operation for services regarding electronic documents. According to previous research, this study proposes a conceptual model representing a synthesis of performance expectation, top-management support, trust to others, and power to partnership, i.e. PUP and PPP, in managing EDMS in government agencies.

Public-Public and Public-Private Partnership

A public-public partnership is a partnership between a government body or public authority and another such body to provide services, sometimes with the goal of transferring technical skills and experience within national development projects (Tucker, Calow, Nickel, and Thaler, 2010). Partners can include other local, regional, state, provincial, national or federal governments. PUPs often have a strong capacity-building element and a focus on long-term sustainability. Because neither partner is taking a profit, revenues can be fully reinvested in services and maintenance. PUPs are characterized by a high degree of trust between partners, because they are not-for-profit and partners generally share the same goals. While it is still necessary to spend time on partnership design and consultations, this process is generally shorter and smoother than for PPPs with less reliance on external consultants and much lower transaction costs. PUPs have the potential to promote more integrated approaches to urban services and water cycle management (Tucker, Calow, Nickel, and Thaler, 2010).

Out of sight of those global policy-makers, however, a growing number of public sector companies have been engaged, in a great variety of ways, in helping others develop the capacity to be effective and accountable public services. These supportive arrangements are called public-public partnership. A PUP is simply a collaboration between two or more public authorities or organizations, based on solidarity, to improve the capacity and effectiveness of one partner in providing public water or sanitation services. They have been described as: "a peer relationship forged around common values and objectives, which exclude profit-seeking." Neither partner expects a commercial profit, directly or indirectly (Hall, et. al, 2009).

Public-private partnership exists in contrast to public-public partnership. A PPP can be seen as a specific type of governance network which can roughly be defined as 'more or less stable patterns of social relations between mutually dependent actors, which form around a policy programme and/or a cluster of means, and which are formed, maintained and changed through series of games' (Koppenjan and Klijn, 2004). The concept of public-private partnership specifically focuses on the interrelation between public and private actors and between governmental and commercial parties. Public-private partnership is an icon of public procurement. Public-private partnership is a partnership for construction, operation and maintenance, and service delivery of public projects by the private sector. Owing to the limit of capacity and innovation, outsourcing of information systems

has been an everlasting policy of government agencies. The superb companies after screening may become the long-term partners in some professional domains. PPP involves governments contracting corporations to design, build, finance, maintain and operate public projects like schools and research institutes. They may involve corporations with contracts over decades.

Public-private partnership has various challenges that must be overcome. Important challenges to public-private partnership involve conflicts of interest between government and private sectors, cost shifting from one partner to another, and managing risk and uncertainty (Rosenau, 1999). When the interests of the public and private partners are aligned and they share common objectives, the process goes smoothly. Managing risk and uncertainty is also crucial to the success of any public-private partnerships. Cost shifting of the less profitable part to the public sector partner is one effective way to reduce risk (Rosenau, 1999). It can increase the attractiveness of the study from the private partner's point of view and demonstrate the government's support and participation.

In general, partnering success is likely in certain contexts (Nagel, 1997). The partnership performs well if there is broad community or societal consensus in the value of the policy goals. Public-private partnerships are also likely to be successful if key decisions are made at the very beginning of the project and set out in a concrete plan, achievable goals are set down, incentives for partners are established, and progress is monitored. For developing EDMS, government agency is regulated by related rules launched by NAA, seeks the recommendations from other agencies and the help from vendors. The partnership among NAA, government agency and other ones becomes the PUP. The partnership between government agency and vendors becomes the PPP. The PUP and PPP in government agencies regarding EDMS could be depicted as follows:

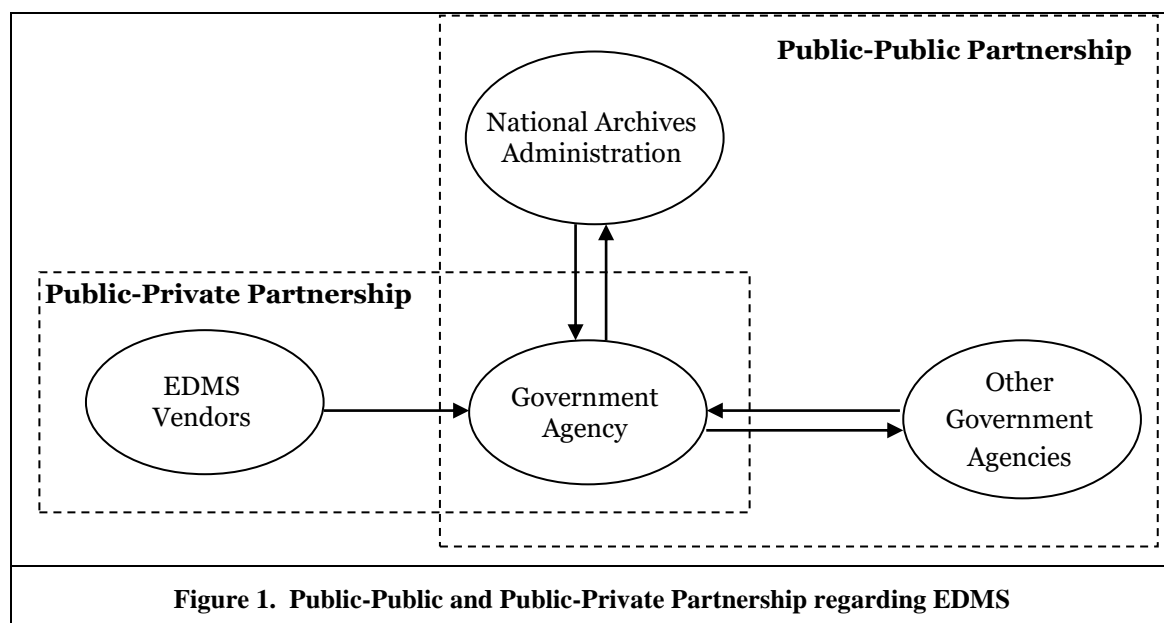


Figure 1. Public-Public and Public-Private Partnership regarding EDMS

Electronic Document Management Systems

The careful placement of a transactional object in relation to others is the paramount record keeping process together with careful depiction of provenance and association with sequences of action. Documents in a file are typically arranged in chronological sequence. An encompassing sequence, imposed over the containers, produces a "file series". In that sequence, documents are in effect being preserved within each of the manila folders. EDMS is the combination of documents and records management software that forced records staff to rediscover the virtues of managing transactional documents and not just their containers.

An EDMS can provide agencies with seamless, integrated information support beyond temporal or geographic constraints (Layne & Lee, 2001). Before the implementation of EDMS, government documents predominantly were paper-based and scattered within and among agencies, which made

their access, utilization, and management difficult for agencies and citizens. By digitalizing government documents, EDMS becomes essential to e-government because they establish a centralized repository of easily and conveniently accessible documents. According to Sprague (1995), government agencies encompass the use of technology to handle paper documents or their electronic equivalent. The use of an EDMS improves agency performance, increases interagency communications, and enhances productivity at both individual and agency levels. Moloj and Mutula (2007) investigated the impacts of document archive support on agencies' decision making and performance and report that the effective use of an EDMS can mitigate the key information gaps with enhanced transparency, accountability, and governance.

Compared with ordinary business organizations, the context for implementing EDMS is relatively unique, featuring mandatory system deployment and use and substantial regulatory compliance demands. In Taiwan, all agencies must implement an EDMS, with the central administration providing a designated budget for their system acquisitions, operations, and maintenance. Timely and convenient access to data and information sharing beyond agency boundaries is critical, but it cannot be accomplished without standardized procedures for electronic archiving, as well as a mandate for unified information sharing among agencies. Both data gathering and information sharing require security and authentication assurance and, therefore, involve enterprise data structure and format specifications. These characteristics arguably make the implementation of an EDMS more challenging than commonly observed system implementations in business organizations. In addition, an EDMS establishes the secured standards necessary for electronic document access and transmission by various agencies.

Previous research also has examined the implementation of the EDMS by different agencies, often using a qualitative method in the form of a case study. For example, Young (2005) conducts three case studies to compare the EDMS implementation in different agencies and suggests cost-efficient strategies. Parrish and Courtney (2007) report a comparative case study that examines the planning process for implementing an EDMS and several challenges common to local agencies. They conclude that a proactive planning process, supported by a forward-looking strategy, can enable agencies to identify future changes that are likely to influence their use of an EDMS. Meijer (2001) analyzes document management system implementations in multiple agencies and reports the emergence of several important trends: a shift in control over information to individuals, a focus on interorganizational information managed concurrently by multiple autonomous agencies, and effective integrations of work procedures and computer-based systems. Finally, Van Wingen, Hathorn, and Sprehe (1999) advocate that government agencies should undertake process reengineering efforts when they design, develop, or implement an EDMS, rather than considering it as a stand-alone system endeavor. They caution agencies to have realistic expectations of and appropriate preparations for effective responses to the important changes to the service context or regulatory requirements.

Factors affecting the Partnership in Implementing EDMS

This study uses social exchange theory as conceptual basis and extends it from individual level to organization level. Social exchange theory is a theory of power-dependence relations. Blau (1964) argues that social exchange mechanisms regulate the interaction between partners by establishment of friendly bonds as well as superordination. This makes trust and power vital factors in social exchange and salient issues in partnerships (Selsky and Parker, 2010). Therefore, we consider top-management support, trust and regulated power as mediating variables in partnership.

Goals or performance expectation of the partners in partnership outrun their social motives by far. Apparently, top management teams tend to rank activities while environmental complexity and pressure increase (Boone, et. al., 2004). Expectation reacting to environment affects the authority of the upper-level leadership such as GuanXi and top-management support (Fan, Zhang, and Yen, 2014). Throughout the life cycle of EDMS assimilation, if continuous support from top management is not provided, it becomes difficult for organizational members to see how EDMS are related to the organization's mission and strategic goals, to allocate valuable resources to support EDMS initiatives, and to overcome inertial routines and establish new ones to actually use EDMS in daily work. Therefore, this study proposes the following hypothesis:

Hypothesis H1: Performance expectation positively affects the top management support in government agency.

Trust gains importance with uncertainty. Previous studies show that trust is more significant under reciprocal exchange conditions than in negotiated ones (Molm et al., 2000). Generalized and co-productive exchange processes entail even greater uncertainty. Consequently, the need for trust increases along the collaborative continuum. Familiarity breeds trust (Gulati, 1995). Performance expectation of an agency enhances their willingness to share and understand their partners and renders more opportunity to mutual trust. Therefore, this study proposes the following hypothesis:

Hypothesis H2: Performance expectation positively affects the trust to others or system in government agency.

Through repeated interactions, relationships grow as a consequence of an unfolding social exchange and coordination process (Muthusamy and White, 2005). In social exchange theory, power is the ability of persons or groups to impose their will on others despite resistance through deterrence either in form of withholding regularly supplied rewards or in the form of punishment (Blau, 1964). Stakeholders might fear the loss of status or public embarrassment because partnerships change existing community structures or force participants to admit failure to provide public services to the poor (Roy and Hartigan, 2008). In the presence of goal conflicts, it is likely that participants try to use power asymmetries to manipulate partnership agendas to achieve more favorable outputs. Performance expectation of an agency affects the priority of resources on emphasizing some regulations from upper agencies. Therefore, this study proposes the following hypothesis:

Hypothesis H3: Performance expectation positively affects the power in government agency.

Although there is no magic formula for successful PUP and PPP, previous studies have discussed several success factors (Bagchi and Paik, 2001). First, and foremost, a successful public-private partnership is often based on a very high level of partnership between government and private sector. The hallmark of a successful partnership is a cooperative and mutually supporting relationship between the two parties and a realization that each party has a stake in the success of the other (Lockwood et al., 2000). Without this recognition and partnership, the partnership causes a waste of time and resources from both parties and fails to produce desired results. Another key to a successful partnership is a strong leadership (Flora et al., 1992). Because a partnership involves many players from both government and the private sector working closely in tandem, it is essential to have a coordinator who can provide leadership and steer the process forward by addressing various complex issues that arise along the way.

Top management support is important for IS innovations that are resource-intensive and require substantial material and managerial resources (Chatterjee, Grewal & Sambamurthy, 2002). Actions by senior managers can modify prevailing structures, introduce complementary structures to facilitate technology use, and reinforce norms that value the use of the technology (Kwon & Zmud, 1987). For EDMS assimilation, this study suggests that top management support plays a key role in each of the actions. By articulating a vision and establishing a strategic plan for EDMS, top management can establish a context with meaning. Moreover, top management can legitimize EDMS by demonstrating their commitment and political support through participation in deployment initiatives. Upper-level leadership is especially crucial to coordinate to reduce conflicts among government agencies. Top-management support has shown significant influence on G2G interaction (Fan, Zhang, and Yen, 2014). Finally, top management can regulate the pace of EDMS assimilation by establishing goals and targets for assimilation. This study proposes the following hypotheses:

Hypothesis H4: Top management support positively affects the public-public partnership.

Hypothesis H5: Top management support positively affects the public-private partnership.

A successful partnership needs patience from government and private sector. Successful partnership seldom occurs spontaneously. It requires long-term investment and farsightedness from both parties, such as trust. Partnerships for development unfold in an uncertain, complex and often distant setting, where good governance is frequently lacking thus requiring an even greater degree of trust (Kolk et al., 2008). Trust can be defined as an “expectation that things or people will not fail us even if there are opportunities and incentives for it” (Nooteboom, 2007). If terms of exchange between participants are known and guaranteed, little trust is needed (Molm et al., 2000). Trust gains importance with uncertainty. Experiments show that trust is more significant under reciprocal exchange conditions

than in negotiated ones (Molm et al., 2000). Generalized and coproductive exchange processes entail even greater uncertainty. Consequently, the need for trust increases along the collaborative continuum. Familiarity breeds trust (Gulati, 1995). If participants share background assumption and experiences, trust develops more quickly (Lane and Bachmann, 1996). For-profit and not-for-profit mindsets can collide heavily in partnerships (Dahan et al., 2010). Conflicting goals can easily become a source of suspicion (Roloff, 2008).

Zhang and Jia (2009) defined trust as the expectation that another organization can be relied on to fulfill its obligations, to behave in a predictable manner, and to act and negotiate fairly even when the possibility of opportunism is present. Researchers have agreed that a complete account of trust should encompass two types of elements, namely, calculative and noncalculative (McEvily et al., 2003). The calculative component reflects the focal organization's confidence in its partner's reliability and predictability, confidence that stems from the belief that costly sanctions for a breach of trust will exceed any gains from opportunistic behavior (Ring and Van de Ben, 1992). The noncalculative component involves learning about the partner organization and its motives as well as possible identification with and even internationalization of the partner's interests (Lewicki and Bunker, 1996).

Gulati and Sytch (2008) have suggested that inter-organizational trust represents an organization's expectation that its counterpart will not interact opportunistically. Furthermore, trust may substitute for formal governance if the cooperative behavior that trust generates offers a less costly and more effective safeguard than complex contracts or vertical integration. Muthusamy and White (2005) point out that cooperative relationship among partners foster a climate of openness, trust and, to some extent, reciprocity. Trust or reciprocity among partners facilitates knowledge sharing, which generally leads to a positive outcome. As noted, we know that the more prior ties shared by partners, the more they will trust one another; indeed, previous research has emphasized that trust emerges from prior collaborative relationships (Das and Teng, 1998). In addition, prior ties can prevent partners from behaving in a counterproductive manner, thereby increasing the likelihood that the collaboration will succeed (Das and Rahman, 2001). The relational characteristics fostered by prior ties among partners manifest themselves as inter-organizational trust, and they constitute an underlying mechanism for the documented influence of prior ties on cooperation effects. Therefore, this study proposes the following hypotheses:

Hypothesis H6: Trust to other agencies positively affects the public-public partnership.

Hypothesis H7: Trust to other agencies positively affects the public-private partnership.

Power refers to the relative dependence between exchange members, where power gained by one member can influence the decisions and behaviors of other members (Gaski, 1984). Organizations usually exercise power or control over other organizations while their resources are the contingency of asymmetry in a partnership (Griffith et al., 2006). Power imbalances are likely to occur (Babiak and Thibault, 2009; Stadtler, 2011) because partnerships are regularly framed by asymmetrical resource positions (Murphy and Coleman, 2000). Asymmetric possession of strategic resources and lack of alternative substitutes cause unilateral dependence (Blau, 1964; Pfeffer and Salancik, 1978). Powerful participants could actually force partners to disclose resources. Though the digital signature is not necessary to be used in EDMS, the processes of EDMS in government agencies are regulated by the rules launched by NAA. The power on agencies makes their willingness to enhance PUP and PPP. Thus, power is proposed for the parameter of exchange in the partnership. Therefore, this study proposes the following hypotheses:

Hypothesis H8: Power positively affects the public-public partnership.

Hypothesis H9: Power positively affects the public-private partnership.

The proposed research model in this study is depicted as Figure 2.

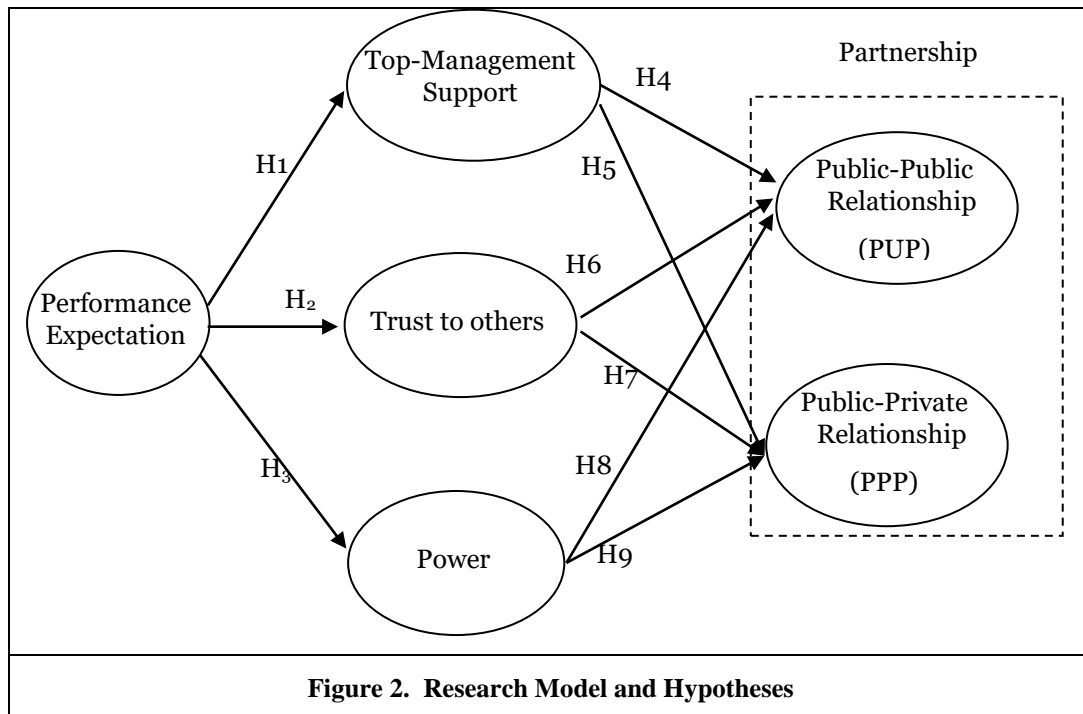


Figure 2. Research Model and Hypotheses

Research Methodology

On the basis of the proposed research framework, this study first identifies the specific constructs to be examined and then operationalizes them using relevant measures from prior research. Several domain experts review a preliminary questionnaire and provide their evaluative feedback. The e-government policy in Taiwan claims that all agencies need to implement EDMS for the fulfillment of the Information Freedom Act. This study will take a key informant approach by targeting management staffs, who understand the implementation and current practice of EDMS within the agency. The survey packet, consisting of a cover letter describing the objective, data management plan and the questionnaire of this study, will be sent to government agencies via postal mail. After data collected, factor analysis and Cronbach's alpha will be used to evaluate the construct validity and reliability of each construct. Besides, structural equation modeling (SEM) will be used for testing the fitness of the proposed model. After that, this study proposes findings and managerial implications.

DATA COLLECTION

On the basis of the proposed research framework, this study first identified the specific constructs to be examined and then operationalized them using relevant measures from prior research. Several domain experts reviewed a preliminary questionnaire and provided their evaluative feedback. E-government policy in Taiwan requires all agencies to implement their EDMS and report their digitization performance such as exchange rate of electronic document to the NAA. For better understanding the PUP and PPP of EDMS, this study sponsored by the NAA takes government agencies with electronic exchange rate > 60% and digitization ratio > 60% as targets. The survey packet consisted of a cover letter describing our objectives and data management plan, a support letter from the NAA, and the questionnaire was sent to government agencies via postal mail. Per agency has one response which often completed by records management staff who understand the implementation of EDMS within the agency. There are 292 responses including 225 administration agencies, 24 business agencies, and 43 schools and accounted for an effective response rate of 23.95%.

ANALYSIS RESULT AND DISCUSSION

The measurement model is examined to assess the reliability, convergent validity and discriminant validity of the latent variables. Reliability refers to the consistency of the item that measures the same construct, and it is assessed by examining if the composite reliability and factor loadings of the

construct is greater than 0.7. Convergent validity reflects the degree to which the items measuring the same construct correspond, and it is assessed by checking if the average variance extracted (AVE) of each construct from its indicators is greater than 0.5. Table 1 illustrates the analysis results of factor loadings, composite reliability and AVE of the four constructs in our research model.

Table 1. Analysis Results of the Measurement Model				
Construct	Items	Loadings	CR	AVE
Performance	EDMS allows the agency to provide services to the public quickly	0.970	0.967	0.909
	EDMS allows the agency to provide services to the people easily	0.988		
	EDMS enhances the service performance of my organization	0.900		
Top-management Support	The head of the organization reveals the mission of EDMS	0.891	0.963	0.899
	The head of the organization involves in the development of a strategy for EDMS	0.977		
	The head of the organization participates in setting goal and standard od EDMS	0.974		
Trust to others	Our organization thinks that the service provided by EDMS vendors is satisfactory	0.946	0.963	0.898
	Our organization thinks that the service provided by EDMS vendors is professional	0.955		
	Our organization thinks that the service provided by EDMS vendors is trusted	0.943		
Power	Managers of our organization suggest that we should use EDMS	0.875	0.947	0.856
	Top manager of our organization suggests that we should use EDMS	0.970		
	Peers of our organization suggest that we should use EDMS	0.929		
Public-Public Relationship (PUP)	NAA provides advices to the development of EDMS in my organization	0.884	0.895	0.811
	NAA proposes the standard for the operation of EDMS in my organization	0.917		
Public-Private Relationship (PPP)	Vendors have provided advices to the development of EDMS in my organization	0.837	0.861	0.757
	Vendors have provided useful resources to assist the operations of EDMS in my organization	0.902		

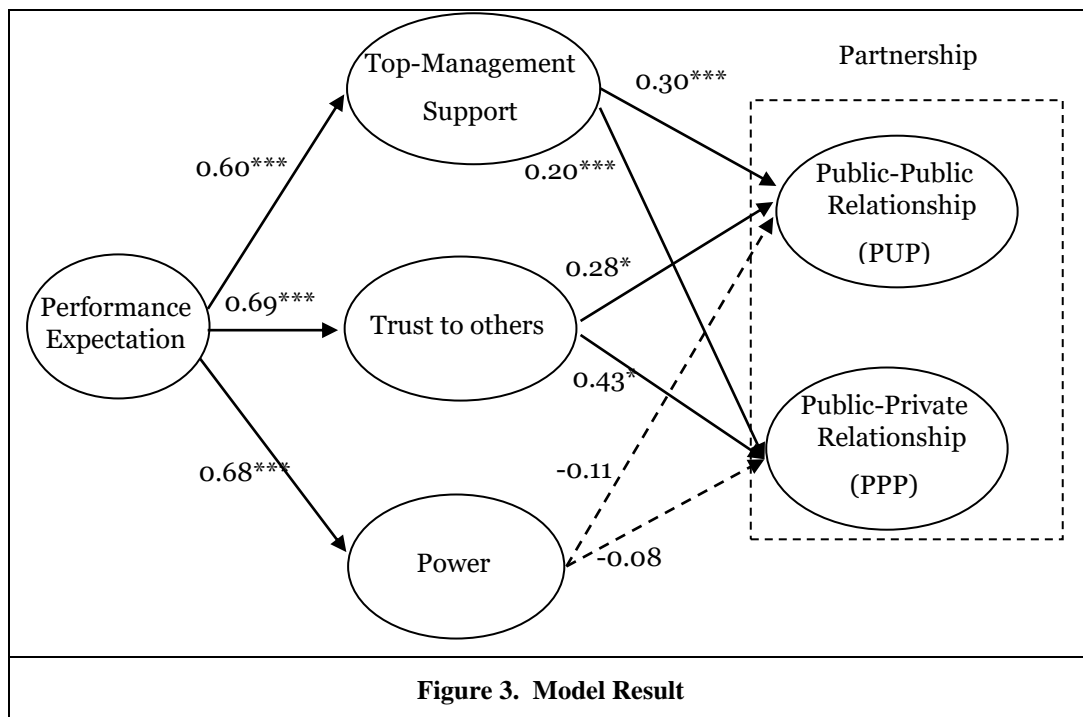
From Table 1 we can see that most factor loadings have exceeded 0.9, while the composite reliability of each construct is also higher than 0.9, providing an adequate support for reliability of the constructs. The average variance extracted of each construct has exceeded 0.75, which is far above the criterion of 0.5, suggesting a good convergent validity of the construct.

Testing of the Measurement Model

We examined the structural model in AMOS 22.0 to analyze the path relationship between constructs. The measurement model yields the following fit statistics: comparative fit index (CFI) is 0.969, normed fit index (NFI) is 0.953 and goodness-of-fit index (GFI) is 0.903. Root mean square error of

approximation (RMSEA) is 0.079. This suggests that the hypothesized measurement model fits the data reasonably well in Table 2.

Table 2. Model fitness for the proposed research model	
Fit Index	Model
CMIN/DF	2.797
GFI (Goodness-of-Fit Index)	0.903
AGFI (Adjusted GFI)	0.861
NFI (Normal Fit Index)	0.953
TLI (Tucker-Lewis Index)	0.961
CFI (Comparative Fit Index)	0.969
PNFI (Parsimony-Adjusted NFI)	0.754
PCFI (Parsimony-Adjusted CFI)	0.767
RMSEA (Root Mean Square Error of Approximation)	0.079



Therefore, hypotheses H1, H2, H3, H4, H5, H6 and H7 are accepted while H8, H9 are rejected. Performance expectation positively affects the top management support, the trust to others or the system and the power in a government agency. Top management support positively affects the PUP and PPP. Trust to other agencies positively affects the PUP and PPP. Power does not positively affect the PUP and PPP.

Conclusion

The main purpose of this study is to explore the factors which affect the PUP and PPP regarding IS in government agencies. This study used EDMS in Taiwan government as the target IS for examining the PUP and PPP among agencies and vendors. We found that performance expectation positively affects the top management support, trust to others and power of government agencies. It means that throughout the life cycle of EDMS assimilation, if continuous support from top management is not provided, it becomes difficult for agencies' staffs to see how EDMS are related to the organization's mission and strategic goals, to allocate valuable resources to support EDMS initiatives, and to overcome inertial routines in daily work. Performance expectation of an agency enhances their willingness to exchange and understand their partners and vendors more opportunity to mutual trust. At the same time, in the presence of goal conflicts, it is likely that participants attempt to use social influence power asymmetries to manipulate partnership agendas to achieve more favorable outputs. Besides, performance expectation of an agency affects the priority of resources on emphasizing some regulations on social influence.

Because a partnership involves many players from both government and the private sector working closely in tandem, it is essential to have a coordinator who can provide leadership and steer the process forward by addressing various complex issues that arise along the way. This study suggests that, regardless of support from NAA or vendors, the top management support plays a key role in each of the actions. By articulating a vision and establishing a strategic plan for EDMS, top management can establish a context with meaning. Moreover, top management can legitimize EDMS by demonstrating their commitment and political support through participation in deployment initiatives. Upper-level leadership is especially crucial to coordinate to reduce conflicts among government agencies.

Successful partnership seldom occurs spontaneously. A successful partnership needs patience from government and private sector. It requires long-term investment and farsightedness from both parties, such as trust. Furthermore, trust may substitute for formal governance if the cooperative behavior that trust generates offers a less costly and more effective safeguard than complex contracts or vertical integration. So service delivery quality in EDMS is very important to get support between NAA and vendors.

Powerful participants could actually force partners to disclose resources. For example, documentation and EDMS processes in government agencies are regulated by the rules launched by NAA. The power on agencies makes their willingness to enhance PUP and PPP. Thus, power is proposed for the parameter of exchange in the partnership. From the analytical results, the power of social influence has no significant effect on the PUP and PPP. It is perhaps that activities of agencies are regulated by rules and therefore the power of peers and managers does not significantly affect PUP or PPP. Further studies can investigate the performance resulting from the PUP and PPP of IS.

Limitations

Although this study has produced useful and meaningful results, we acknowledge that a number of research limitations exist in our research which might be made in the near future. Firstly, since the sample surveyed for this study is only limited in Taiwan government agencies by targeting records management staff, who understand the implementation and current practice of EDMS within the agency. According to the research purpose, responses with electronic exchange rate > 60% and digitization ratio > 60% are collected. Future research may consider surveying various electronic exchange rate and digitization ratio, which can include numerous agencies cultures. In addition to the survey, the future can also be used through interviews to further understand the use of information systems. After that, Thereby, suggesting an integrative theory is restricted. A comparative research is offered to further understandings. Furthermore, because the data in this study are confined to specific EDMS users, it is difficult to fully generalize the results. Future research can explore users of diverse systems.

Contributions

In this study, we used EDMS in Taiwan government as the target IS for examining the PUP and PPP among agencies and vendors. Although that e-government policy in Taiwan requires all agencies to implement EDMS, digital signature technology is not necessary to be used in EDMS. For theoretical contributions, this study used social exchange theory as a valuable analytical concept in exploring collaborative alliances by integrating PUP and PPP regarding EDMS. Power and dependence is the central concept in the alliance. A field survey was conducted. The findings show that performance expectation positively affects the top management support, trust to others and power in a government agency. Top management support positively affects the PUP and PPP. Trust to other agencies positively affects the PUP and PPP. Interestingly, we find that power does not positively affect the PUP and PPP. Regardless of the support from NAA or vendors, the top management support plays a key role in the actions. Upper-level leadership is especially crucial to coordinate and reduce conflicts among government agencies. However, there are no relationships between power and PUP/PPP. After all, what have NAA providing advice and vendors providing resources have to do with power. NAA provides advice because Taiwan government says it is mandatory to implement EDMS and vendors provide resources because they are paid to do so. PUP and PPP require many players from both government and the private sector to work closely in tandem. It is essential to have a coordinator who can provide leadership and steer the process forward by addressing various complex issues that arise along the way. Successful partnership seldom occurs spontaneously. A successful partnership needs patience from government and private sector. Therefore, it requires a long-term investment and farsightedness from both parties and needs to be explored in the future.

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