

An Integrative Approach to Inter-Organizational System Implementation and Evaluation: the Case of Government-to -Business

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Abstract

Over the years, government-to-business (G2B) as an inter-organizational system has emerged as an essential part of e-government systems. Its development and usage have not only been expected to contribute to efficient and effective operations, but G2B is also anticipated for better transparency, reduced costs and improved process. However, although a rich body of literature exists regarding G2B, there is a lack of empirical research finding in understanding the system from multiple stakeholders' perspectives. Hence, using a qualitative case study research approach, we seek to understand the inter-organizational system motivations, issues and challenges for its implementation and success evaluation from the context of system sponsor, government agencies and business organizations. Using the Malaysian background, a specific G2B system is being investigated which is the public e-procurement system. Discussion of the case findings is offered and implications of the study are explained.

Keywords: inter-organizational system, government-to-business, public e-procurement system

1. Introduction

The usage and adoption of information technologies across organizations has increased tremendously due to open standard and availability of the web (Gebauer and Buxmann, 2000). At present, these technologies, better known as inter-organizational system, have been widely deployed not only in private organizations that form partnership (Angeles and Nath, 2007), but also in public sector as a mean to improve their service delivery (Ahmad and Othman, 2007).

One of the interorganizational system applications in the public sector is the public e-procurement system. The system is within the government-to-business (G2B), which is an agenda sets to promote a higher service quality between government entities and the business sector. In past studies, the inter-dependant G2B system has drawn significant interests for researchers to investigate the topic within the area of system development (Liao, 2003), social structure (Devadoss, Pan and Huang, 2002), socio-economic systems (Hardy and Williams, 2007) and usage antecedents (Dooley and Purchase, 2006; Moe, 2004).

However, the investigation of multiple stakeholders is rather scarce as most studies are limited to a single perspective, either from the government as the buyer-side (Alsac, 2007; Croom and Bradon-Jones, 2007; George, 2007) or solely from the business as the seller-side (Kaliannan et al. 2007; Salleh, Rhode and Green, 2006).

Therefore, driven by the limitation, we seek to investigate the motivations, issues and challenges of the G2B from the context of multiple parties ie the system sponsor and users, as well as how success is determined by the sponsor. Thus, using the Malaysian background, this study aims to 1) understand the system sponsor's motivations of public e-procurement system initiation and implementation, 2) understand the public e-procurement usage motivations among the government agencies and business organizations, 3) understand the issues and challenges faced by the system sponsor, government agencies and business organizations and 4) understand the success defined by the system sponsor that should be achieved by the all parties.

2. Review of related theories

Two theories are used as the foundation of the study, which are the stakeholder theory and the inter-organizational theory.

Stakeholder Theory

The stakeholder theory, which is originated from the business ethics area, is formulated based on the blurred character of the stakeholder concept emphasized by many literature. The arguments that the concepts of stakeholder, stakeholder model, stakeholder management are explained and used with diverse and often contradictory evidences motivate Donaldson and Preston (1995) to introduce the new understanding to the stakeholder theory. The three aspects of the theory are the descriptive/empirical, instrumental and normative.

In addition, in the theory, Donaldson and Preston (1995) offer four central theses, which are:

- The stakeholder theory is descriptive in that it describes the corporation as a constellation of corporative interests possessing intrinsic value.
- The stakeholder theory is instrumental in that it establishes a framework for examining the relationships (if any) between the stakeholder management practices and firm performance.
- The fundamental basis of the theory is normative based on these acceptances; stakeholders are identified by their interests in the corporation, regardless of the interest put by the corporation to them, and the interests of all stakeholders are of intrinsic value.
- The stakeholder theory is managerial in that it recommends attitudes, structures and practices to be taken together, to constitute stakeholder management.

The diagram below denotes the eight parties who have legitimate interests to participate in an enterprise. They are the government, investors, political groups, customers, communities, employees, trade associations and suppliers. All groups seek to obtain benefits from the corporations. The arrows that run in both directions explain "there is no prima facie priority of one set of interests and benefits over another."

Inter-organizational Theory

Motivated by scarce of researches that study organizations as the unit of observation and analysis, and sheer complexity of organizational relations, Evan (1965) departed from the concept of "role-set" (Merton, 1957) to the notion of "organization-set" to further investigate the interactions of a focal organization with the environment elements. His effort is distinguished as a foundation of more recent inter-organizational relations and inter-organizational systems studies as can be seen in the work of Schermerhorn (1975), Oliver (1990), Chatterjee and Ravichandran (2004) and Kothari et al (2005).

The concept of the “organization-set” as proposed by Evan (1965) emphasized on the interactions of organizations within their environment, that latter influences the decision making process. Seven dimensions of organization-set were offered;

1. input vs output organization-set: a focal organization depends on input organizations for resources, materials, legitimacy, financial supports and accreditations. Likewise, it produces products or services to the markets, audiences and clients. Output organizations will include research agencies, government bodies and consumers.
2. comparative vs normative reference organization: when the focal organization evaluate its performance against one or more organizations in its set, the standard for comparison is on the basis of “comparative reference organization”. By contrast, as the focal organization incorporates values and goals of one or more elements of its organization-set, it is referred as “normative reference organization”. The former can be compared to mimetic pressure, while the latter is analogous to normative pressure of institutional theory.
3. size of the organization-set: whether a focal organization interacts with few or many organizations and elements, the interaction size will presumably have significant influence for its internal structure and decision making.
4. concentration of input organizational resources: the number of input elements that the organization depend for their resources will affect the structure and function of the focal organization.
5. overlap in membership: professional affiliation, trade union membership and members of the board of directors are the instances of membership overlap, that will also influence the structure.
6. overlap in goals and values: the goals and value of the focal organization may overlap with those of the elements in the set, for instance, as in the case of government agencies and federations.
7. boundary personnel: staff and personnel classification will differentiate the functions and organizational boundaries imparted on the employees. Three levels of functions in the formal organizations are the institutional, managerial and technical.

Using the dimensions, Evan (1965) posited they will have significant influence in the inter-organizational relation practices and processes. Albeit the actual empirical work was not conducted, the conception was later adopted by contemporary researchers.

Looking at one aspect, inter-organizational theory may resemble institutional theory in how it expresses the general relations of organizational set. However, it further deepens the discussions of the normative and comparative reference organizations without emphasizing too much on the isomorphic forces. Rather, it lightens the pressures by stimulating the values of engaging with others in the network environment through the processes of coordination, integration, cooperation and amalgamation. Thus, although inter-organizational theory does not seem to reach its maturity, neglecting its presence in the organizations systems studies will further augment the complexity of related researches.

As a result, the researcher believes incorporating the processes in an inter-organization system study is imperative. Still, integrating them is a complex and challenging process especially when the degree of coercive legitimate power may surpass other determinants of the system adoption such as in the public e-procurement systems environment.

3. The Malaysian Public E-Procurement System

The Malaysian government electronic procurement system, known as the *ePerolehan* (eP) was initiated in 1999 with the aims to

streamline public purchases processes and improve the quality of services. *ePerolehan* is a multi-buyer, multi-supplier electronic procurement domain, which allows government agencies to function as independent buying entities under a single buying organisation. It provides a standard procurement method for both goods and services following the Government's procurement policy and procedure (Rashid, 2007). With the system, goods and services purchasing interaction and transaction

between the federal government users as the buyers and the suppliers as the sellers can be conducted online. The missions and goals of *ePerolehan* are to improve transparency, more economical operation and user friendly.

The government as the buyers and business organizations as the suppliers are the two direct users of the system. The groups and users of the system, and the interaction among them are represented in Fig 1.

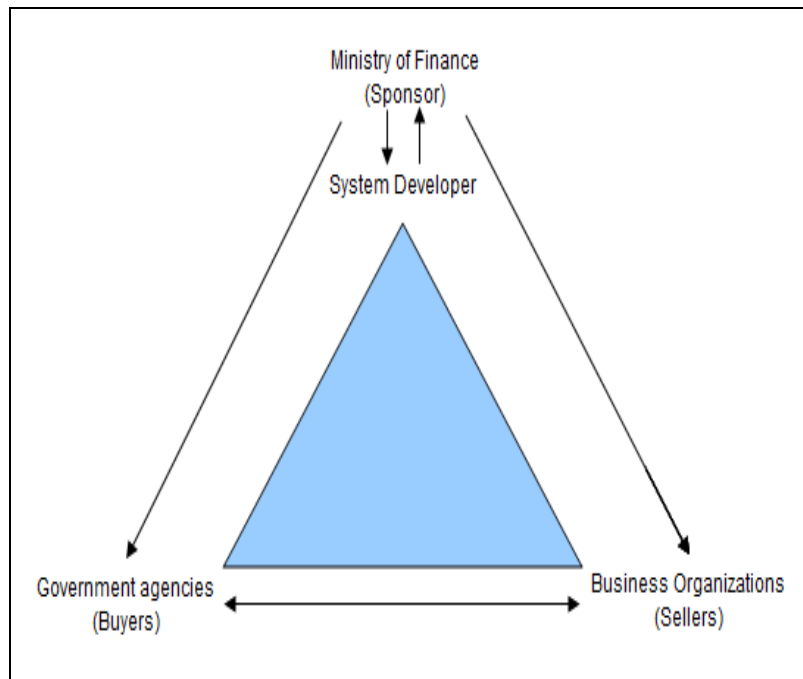


Fig 1: Malaysian ePerolehan system and interaction

In general, the Ministry of Finance is responsible for system monitoring, implementation and maintenance, data centre operation, user training, technology transfer and policy and procedure implementation. The

modules of the system are supplier registration, central contract, direct purchase, quotation system, tender system and e-bidding. The following table provides a summary of the modules services

Table 1: ePerolehan modules and services

Module	Services
Supplier registration	<ul style="list-style-type: none"> • Registration as New Contractor/Consultant to the Government of Malaysia, renewal, application for additional category, online update of company profile
Central contract	<ul style="list-style-type: none"> • Requisition Processing: The requisition process starts when the Government User selects products or services to procure and ends when a purchase order (PO) has been sent to the Supplier. • Order Fulfilment: The order fulfilment process involves acceptance of the PO by the Supplier, fulfilment of order by the Supplier and confirmation of receipt of goods or services by the Government User.
Direct purchase (purchase worth up to RM50,000.00)	<ul style="list-style-type: none"> • Requisition Processing: The requisition process starts when the Government User selects a product to procure, and it ends when a purchase order (PO) is sent to the Supplier. • Order Fulfilment: The order fulfilment process involves the fulfilment of order by the Supplier, confirmation of receipt of goods by the Government User and the Payment to the Supplier.
Quotation system (purchase worth up to RM200,000.00)	<ul style="list-style-type: none"> • Quotation process is for any purchase with a total value of RM100,000 but less than RM200,000. • Through the quotation process, invitation is sent out to the identified suppliers which enables prompt response from the suppliers
Tender system (purchase worth more than RM200,000.00)	<ul style="list-style-type: none"> • Tender is for procurement with the value of RM200,000 or more. • The suggested system will simplify the procurement process, as online transaction will be quickly and securely implemented.
E-bidding	<ul style="list-style-type: none"> • Enable interested and qualified suppliers to bid online, anywhere within the bidding period. • Module enables bidders to view their current bidding status and bidding level.

Source: ePerolehan Unit, Ministry of Finance, Malaysia

4. Research Approach

To meet the research purpose, several set of interviews were conducted with the *ePerolehan* Unit Project Director, government agencies and business suppliers. Being in the unit that overviews and manages the ins and outs of the public e-procurement system, and has direct controls to the design, implementation and adoption, the Project Director's insights, knowledge and beliefs provide useful inputs to the study.

The interview with the system *ePerolehan* Unit, Ministry of Finance, was conducted to answer the following questions:

1. What are the motivations for the *ePerolehan* initiation?
2. What are the challenges faced by the system sponsor in promoting the system

use among government agencies and business suppliers?

3. How is success defined in the context of Malaysian public e-procurement system?

On the other hand, the interviews with the government agencies and the business organizations were conducted to answer the following question:

1. What are the motivations behind the system use?
2. What are the issues and challenges faced by the organization in accepting and using the system?

Two government agencies participated in the interviews. One was an agency of the Ministry of Education, and the other was an agency of the Ministry of Health. Two business organizations also participated in the

interview, which one of them was a construction company and the other was a pharmaceutical company.

5. Case Description

Ministry of Finance (System Sponsor)

In total, there are 16 discourse units derived from the interview with the Project Director. Although the units may seem small, they still provide a rich content as many issues have been highlighted. Once the interview transcription had been analyzed, a copy of the report was sent to the Project Director for verification and correction purposes. The feedback verifies the information written in the report does not deviate from the interview.

Question 1:

What are the motivations for the *ePerolehan* initiation?

The system is implemented as part of the Malaysian e-government initiatives to improve the public service delivery. It is the vision that calls for IT reformation in the government sector that will enable the government, business and citizens to work together seamlessly for the Malaysian benefits. Moreover, the main missions of the system are to have more transparent procurement practices, to reduce procurement operation costs, to have more efficient procurement activities by reducing the processing time via a more user-friendly system. The objective is to have a visible monitoring system and ensure no business is awarded to unqualified contractors.

ePerolehan system was initially implemented in 1999 as a national agenda. It has been utilised by government agencies, business suppliers and other relevant government departments for nearly 10 years. The implementation has been divided into four phases; design, design and small scale roll-out, full scale roll-out and submission from the system developer to the government. Initially, the government targeted to take over the system operation and maintenance from the consultant in 2007. However, due to technical and financial problems, the hand-over will take effect in 2012.

Question 2:

What are the challenges faced by the system sponsor in promoting the system use among government agencies and business suppliers?

Multiple issues govern the acceptance and the adoption of the system from both government organizations and business suppliers. The *ePerolehan* system is a new phenomenon to most users, especially to the ones who lack the necessary IT skills and knowledge. Yet, not only users are the concern as there are organizations that have limitations to adopt the system.

One of them is the issue of accepting electronic system as a means of conducting business operation as compared to the old manual process. Thus, the ability of organizations and users to react to changes plays an important part. Apart of that, accepting the new system requires building the knowledge and skills of the users, and IT know-how is the main issue. To tackle the problem, the *ePerolehan* Unit has organized series of courses to train users in order to ensure the system know-how is not a barrier.

In addition, the size of the organization of the organizations, especially the business suppliers determines the reaction. Large organizations seem not to have any difficulties adopting the system as they have the adequate skills, resources and good financial support. However, that is not always applicable to small size organizations that have resources limitations, especially the IT infrastructure and facilities.

Furthermore, information technology infrastructure determines the readiness and technological competencies of the agencies and business organizations. The *ePerolehan* is a highly secured system that requires integration with other government departments as well as the financial institutions. Thus, participating organizations must have compatible infrastructure, in addition to deploying specific identification devices and smart cards. But again, not all organizations are able to arrange for the underlying technological foundations.

However, although the system is mandatory to all federal government agencies, there were

some leniencies granted. They were still permitted to partially use the *ePerolehan* system or use both systems in parallel. However, such practices will no longer be allowed as government agencies are subject to abiding mandatory legislative direction.

As emphasized by the Project Director, *ePerolehan* is a new phenomenon that differs from the old public procurement management and practices. The new system enables shorter work flow and processing time up to 70%. Besides, it reduces resources used that leads to cost saving. But, it takes time to change. Thus, the unit has given their best by continuously conducting discussion sessions, trainings and forums with government agencies and business suppliers, apart of providing assistance to users when needed.

Question 3:

How is success defined in the context of Malaysian public e-procurement system?

Even though the missions signify for the success, the system sponsor has other indicators to gauge the effectiveness. Three indicators are currently being used, which are the number of government agencies that have deployed the system, the number of business suppliers and the yearly forecasted and actual government financial spending. The indicators are measured every year, and the statistics have shown steady increment in user participations and in the actual online transactions.

Government Agencies (Buyers)

The feedback from the government agencies are summarized as the following.

Question 1:

What are the motivations behind the system use?

Agency 1

The agency was considered as a medium-size organization, which was located at an urban area. They have been using the system for two years. Previously they used a system which was linked to the Accounting General system. There were 15 employees working in the

administration department, with five of them being the direct users of the system. The yearly procurement transaction was less than RM250,000.00. As utilizing *ePerolehan* is a mandatory practice to all federal government agencies, the main motivation was the compliance to the administration policy. In this context, the agency faced pressures to conform to the requirements, as violating them may call for a legitimate accordance.

In addition, in terms of knowledge and skills, the users have adequate computer proficiencies that enable them to easily understand and use the system. The ability of the users helped to expedite the usage of the system in the agency.

However, the agency had faced operation and procurement issues that hindered them from utilizing all the *ePerolehan* modules. As a result, only the central contract and the direct purchase modules were being fully implemented and used. Fortunately the top management was really serious in ensuring the policy was adhered by sending the respective employees to the trainings and making sure the constraints were resolved.

Agency 2

The agency was a hospital located at the northern part of Malaysia. There were approximately 200 medical and non-medical staffs. The yearly procurement transaction was closed to RM1.5 million. The agency has been using the *ePerolehan* system since 2006.

The strong supports from the ministry and the chief directors made the agency able to use almost all of the modules, except the e-bidding since it was a new component and only available to head agencies. The agency used the central contact, direct purchase, quotation system, tender system and the ministry contract in fulfilling their procurement activities.

In addition, the top management always ensured the agency was equipped with the necessary IT infrastructure, network connection and required software. This was due to the management's belief that conducive environment is crucial for employees

productivity and process efficiency. Moreover, the top management encouraged the employees to share the government's missions and visions that include deliberating good work conducts and attitudes. As a result, employees are motivated to accept and use the information technology reformation in the government services.

Question 2:

What are the issues and challenges faced by the organization in accepting and using the system?

Agency 1

One of them was the users' reactions. They varied as few of them felt the system did not really meet their task requirements. There were certain features that they had used to have were found missing from the present e-procurement system. However, the constraints did not restrict them from engaging in the daily operation procedures as the skills and knowledge they possessed helped to overcome their judgement. But the negative feedbacks were only from the minority as the rest were positive with the new IT changes.

The agency did not have any problem in integrating their existing system to the federal e-procurement system. Technical assistance was always available when they had system problems. But the inability of the agency to fully utilise the system was due to legal and administration procedures. Existing procedures did not seem to be compatible with the online procurement legal requirements.

Agency 2

There were complaints from the users about the system features. They felt the system was not meeting all of the public procurement requirements. Hence, it made the system did not fit very well into the users' work style. However, despite the unmatched issue, in the opinion of the users, the system gave beneficial assistance. For instance, it made the procurement process more efficient by reducing the time. In addition, the automation also eased the old, manual method by providing more informed decision and improving the quality of the information. In

that way, users accepted the new system and felt implementing the ePerolehan in the government agencies was a valuable effort.

Business Organizations (Suppliers)

The feedback from the business organizations are summarized as the following.

Question 1:

What are the motivations behind the system use?

Supplier 1

The organization was a pharmaceutical company, located closed to the capital city. They have been using the system for almost three years. Though they had to bear the costs of using the system through the devices purchase and training fees, the company considered it was a worth investment as they saw tremendous business opportunities. This was due to the belief that the public procurement automation would offer unlimited business prospects with thousands of government agencies. In addition, the top management who was also the main user has had an adequate computer skill which was essential for the system usage. Thus, apart of policy requirement, the positive mind-set and the essential computer skills are the important motivations for the system usage.

Supplier 2

The second supplier was a small size construction company, which was located at the outskirts of the country's administration city. They had first attended the awareness course provided by an appointed training provider in mid 2000. During that time, they were supplied with the initial devices and received waived supplier registration fees. The company had several attempts to use the system. However, after a year, which when the period was expired, they no longer had any initiative to continue using the system. The main reason was lack of understanding on the system capability. In addition, the top management was not really serious in utilizing the system for better business opportunities.

Question 2:

What are the issues and challenges in accepting and using the system?

Supplier 1

Very few issues govern the usage issues. However, for them, they were very minor and common business challenges. One of them is the knowledge and ability to use the system to the maximum. Although the size of the company was small, and there were only two users, they really felt having to know how to operate the system was very importance since the IT skills and knowledge provided a competitive advantage to the company. This was because not only they were able to participate and make business with the government, but also the manager strongly believed information technology is the foundation of business survival. Therefore, the company did not hesitate to invest in the IT infrastructure and getting the required devices. They also sent the employees to the training provided and actively seek for business opportunities.

Supplier 2

The manager of the company felt the system was difficult to use and the procedure was quite tedious. Although the users in the company had basic IT skills, and knew the importance of computers and networking in today's business world, the manager was not really serious in manipulating the skills and opportunities offered by the government. The attitude further added to more issues. As they were incompetent, the top management did not take any effort in sending the users for related trainings. Besides, the attitude also caused the company not to invest in the devices

requirement, which made them not to have appropriate IT infrastructure.

6. Discussion

Based on the case study findings, we find essential responsibilities for the system sponsor in formulating and realizing the national strategy. There are legal procedure, system requirement, project monitoring, technology transfer, implementation and

maintenance, data centre operation and user training. In addition, the Ministry of Finance as the sponsor is also responsible for ensuring the goals and objectives of the public e-procurement system are met, which the goals are transparency, process efficiency, cost efficiency and increasing the user satisfaction by offering a more user friendly system. Moreover, the main vision of the federal government which is to provide higher quality service adds to the motivations.

In addition to the sponsor's motivations, we find shared factors that enable the use of the system among the government agencies and the business organizations. Although the system is deem mandatory for the agencies, there are certain other aspects that govern their system use. We then propose for a model that illustrates the public procurement system success and factors that determine the use. While the success is derived from the sponsor's motivations, the usage factors are drawn from the shared determinants obtained from the interviews. The discussion of the factors is offered below.

Skills and knowledge

From the case, we find user computers skills is an essential determinant of the system use. It is reflected in the Agency 1 and Supplier 1 who confirm the skills of the users eases the system usage. This is similar to Koufaris (2003) who asserts one of the most important antecedents of information system usage is user skills and knowledge of information systems. Similarly, the term skills and knowledge is used interchangeably with self-efficacy. Compeau and Higgins (1995) define self-efficacy as the belief that one has the capability to perform a particular behaviour. The belief on the capability to successfully execute the behaviour will lead to the expectations of positive outcomes (Compeau et al, 1999). Additionally, research in information systems has demonstrated a strong link between individual skills and knowledge and the reactions to adopting and using computers (Compeau et al, 1999 ; Compeau and Higgins, 1995).

Training

The importance of user training for information system success is also found to be a factor for the system use. Training is important to provide a general background to familiarize users with the general use of computer technology (Guimaraes et al, 2003). In public e-procurement system, the role of training has been found to be a determinant to the system use as more mistakes can be made by employees if they are poorly trained (Rahim, 2008 ; Leipold et al, 2004).

Attitude

User attitude is what the Project Director found to be an important usage aspect. The user attitude is confirmed by the first agency and users who do not like to use the system will talk to their manager about their opinion and find ways not to use it. Fishbein and Azjen (1975) view attitude as the affect that one feels against or for some object or behavior (Sabherwal et al, 2006). Theory of planned behavior (Azjen, 1991) asserts that attitude is a direct determinant of behavioral intention, which in turns affects behavior. The case is also consistent with Sabherwal et al. (2006) who found a positive relationship between attitude and behavioural use.

IT infrastructure

As mentioned by the Project Director, the system requires appropriate IT infrastructure in terms of software, hardware and network connection. Agencies or companies that have poor infrastructure will not be able to utilise the system as in the case of Supplier 2. As verified by Seong and Lee (2004), information technology infrastructure is the success factor for South Korean's achievement in adopting their public e-procurement system. The similar finding is also shared by Reddick (2004), in which his study proves organizational IT infrastructure has a significant role to public e-procurement system adoption.

Top management support

The factor is one of the most important determinants for the system use. This is because, without strong top management support, strategies and policies will not be

implemented and infrastructure will not be available as there is lack of financial commitment. From the case, supplier 1 and supplier 2 represent the phenomenon. Unlike supplier 2, the supplier 1 manager is more serious in implementing the system. From the literature, Moon (2005), Seong and Lee (2004), Leipold et al. (2004) and Reddick (2004) verify top management emphasis has a significant influence to the public e-procurement adoption.

Policy compliance

Coercive pressures are the legitimate regulations that require institutions or organizations to oblige them. In the context of public e-procurement system, the legitimate regulations can be traced as the policy compliance among the government agencies. In this perspective, federal government agencies are required to use the system for fulfilling the procurement process as the policy is mandatory. With this regard, the agencies are not given any option. Thus, all federal government agencies must conform and comply with the policy requirement.

Based on the discussion, we thus propose a model as depicted in Fig 3 that reflects the responsibility of the system sponsor in formulating the means to make the mission a reality. We then suggest for the factors that will have influence to the use of the public e-procurement system for both the government agencies and business organizations. Once the system has been in operation, the success and value should be gauged by the dimensions of transparency, process efficiency, cost efficiency, service quality and user satisfaction.

7. Conclusion

Implementing and evaluating an inter-organizational system is a complex and costly process as it requires multiple stakeholders' interests. Thus, building on a government-to-business system, specifically on the public e-procurement system, we propose a model to measure the system success based on sponsor's motivations, and offer the shared factors from the viewpoints of government agencies and business organizations. Although there are still many other issues, we believe the factors are

the most essential and generic enough to be used across IOS environment particularly the e-government cases. As the model is developed based on a case, we suggest validating the

model via a survey. Such investigation will produce statistical evidences that can be generalized across studies.

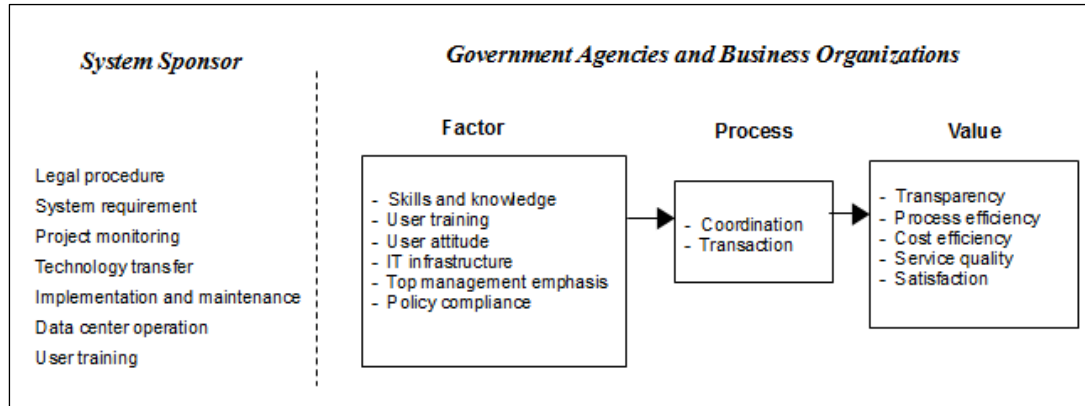


Fig 1: Model of IOS Implementation and Evaluation

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