

2009

# Measurements, feedback and empowerment: Critical systems theory as a basis for software process improvement

Kitsada Dolpanya

*The University of New South Wales, kitsada@student.unsw.edu.au*

Lesley Land

*The University of New South Wales, l.land@unsw.edu.au*

Geoffery Dick

*The University of New South Wales, g.dick@unsw.edu.au*

Follow this and additional works at: <http://aisel.aisnet.org/ecis2009>

---

## Recommended Citation

Dolpanya, Kitsada; Land, Lesley; and Dick, Geoffery, "Measurements, feedback and empowerment: Critical systems theory as a basis for software process improvement" (2009). *ECIS 2009 Proceedings*. 100.

<http://aisel.aisnet.org/ecis2009/100>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# UNDERSTANDING SUPPLIERS' PARTICIPATION IN BUSINESS-TO-GOVERNMENT (B2G) ELECTRONIC AUCTION MARKETS IN THE THAI CONTEXT

Dolpanya, Kitsada, The University of New South Wales, School of Information Systems, Technology and Management, Sydney, New South Wales 2052, Australia, kitsada@student.unsw.edu.au

Land, Lesley Pek Wee, The University of New South Wales, School of Information Systems, Technology and Management, Sydney, New South Wales 2052, Australia, l.land@unsw.edu.au

Dick, Geoff, The University of New South Wales, School of Information Systems, Technology and Management, Sydney, New South Wales 2052, Australia, g.dick@unsw.edu.au

## Abstract

*Despite business-to-government (B2G) electronic auction (e-auction) markets being a way for suppliers to create opportunities for market expansion and for trading activities, little has been done to understand the behaviour of suppliers participating in these markets. In this paper, we propose a framework to explain suppliers' intention to participate, and the level of participation in B2G e-auction markets, which will be tested in the Thai B2G e-auction markets. Low supplier participation has been a major problem in the Thai e-auction markets. We posit that suppliers' participation depends on organisational motivation, environmental uncertainty, and their capabilities. The conceptual framework draws from the Motivation-Ability Framework, Transaction Cost Theory, Institutional Theory, and Resource-Based Theory. It proposes that four key constructs - efficiency motive, legitimacy motive, environmental uncertainty, and organisational capabilities influence suppliers' intention to participate as well as their participation level in B2G e-auction markets. The conceptual framework is developed by drawing on our understanding of the Thai electronic auction market as well as from extensive literature. We believe this framework may be useful to better understand the key reasons for suppliers to participate in B2G e-auction markets.*

*Keywords: Electronic auction markets, Business-to-Government (B2G), Suppliers' participation.*

# 1 INTRODUCTION

Business-to-Government (B2G)<sup>1</sup> electronic markets can be considered as an inter-organisational information system with which participating buyers and sellers utilize electronic markets for a dynamic price-making mechanism (such as electronic auctions), as well as for the exchange of information related to price, product specification, and terms of the trade (Bakos 1991; Grewal & Comer & Mehta 2001). Electronic auction (e-auction) markets are increasingly being used in B2G electronic markets to procure goods and services for governments; they have been reported to yield significant price reductions and time saving for governments as well as to create opportunity for suppliers to penetrate new markets (Beall et al. 2003; Emiliani & Stec 2002; Smeltzer & Carr 2003).

The majority of research on e-auction markets is focused on developed countries, primarily in North America and Europe (Germer & Carter & Kaufmann 2004). There is very little empirical evidence on how B2G e-auction markets perform in the context of developing countries. Developing countries generally lack resources (e.g. skilled people, proper ICT infrastructure) and they also generally report slow economic progress (Jones 2007), compared with developed countries. Molla and Licker (2005) also support this assertion and further suggested that businesses in developing countries are faced with number of challenges (such as technological, financial, and legal infrastructure constraints) in their adoption of e-commerce. These are example barriers to the development and support for B2G e-auction markets. The literature also reports the need for transparency in e-government procurement, especially in developing countries (Rege 2001). Equity is generally promoted for developing countries (UN 2005). B2G e-markets can result in more equity in supplier participation (MacManus 2002) and therefore allow new suppliers to enter the marketplace using a competitive bidding process. For all the above reasons, this study which will be conducted in a developing country is particularly interesting. It will therefore increase our understanding of how B2G e-market will assist the Thai government in promoting the level of suppliers' participation.

The Thai B2G e-auction markets have a number of characteristics that make them suitable for this study. Firstly, the study of B2G e-auction markets has become significantly important for the procurement of goods and services in South East Asian countries including Thailand (Jones 2007; Settoon & Wyld 2003). The Thai government shows commitment in promoting the B2G e-auction markets by making it mandatory for all Thai government agencies to procure goods and services through e-auction markets, whenever the procurement value is more than 2 million Baht (US\$ 60,000). Secondly, the National Statistical Organization (NSO) of Thailand reported that the participation of suppliers in Thai B2G electronic markets is low. Only 0.3% of businesses participate in B2G e-markets compared to 85.3% in business-to-consumer (B2C) and 14.4% in business-to-business (B2B) electronic commerce (NSO 2007). Thirdly, primary researcher has full access to the Thai e-auction markets which makes this study possible.

Prior studies suggest that a sufficient number of qualified suppliers participating in B2G e-auction markets can lead to a competitive market environment (Beall et al. 2003; Elmaghraby 2005; Smeltzer & Carr 2003). Thus, the number of qualified suppliers plays a significant role for the success of e-auction markets. However, the effort to understand the behaviour of suppliers participating in B2G e-auction markets has been lacking. Prior research in this area has two main foci, both in terms of the type of electronic marketplaces (i.e. B2B electronic marketplaces) (Grewal et al. 2001; Son & Benbasat 2007) as well as the research approach (i.e. qualitative case studies). Qualitative case studies provide a rich picture of specific phenomenon within the chosen context (e.g. (Emiliani & Stec 2005; Hackney & Jones & Lössch 2007; Soh & Markus & Goh 2006). However, the results do not allow us to generalize to other settings and they also do not allow us to quantitatively validate relationships between key constructs.

---

<sup>1</sup> Business-to-Government is defined as "business activity that involves a business selling its products or services to the central, regional or local government" (source: <http://business.govt.nz>).

From a thorough review of the relevant literature, this study proposes a research framework with an objective to extend our understanding of the antecedents of suppliers participating in B2G e-auction markets by drawing from the relevant literature including these four theories: the Motivation-Ability Framework, Transaction Costs theory, Institution Theory, and Resource-Based Theory. Studies of B2G e-auction markets have been relatively rare so there is still a lack of a good understanding of how B2G e-auction markets work, especially from the suppliers' perspective.

This study contributes to the literature in the following ways: Firstly, this study explicitly focuses on the linkage between B2G e-auction markets and supplier participation behaviour, which has not been done before. Secondly, this study conceptualizes supplier participation behaviour within the Motivation-Ability Framework, Transaction Costs Theory, Institutional Theory, and Resource-Based Theory, to extend our understanding of supplier behaviours in the B2G e-auction markets. Lastly, this study aims to fill a gap in the literature arising from a lack of research in the B2G e-auction markets environment.

## **2 LITERATURE REVIEW**

This literature review is taken from diverse disciplines; marketing, economics, organisation management, strategic management, and information systems. We first introduce the electronic auction mechanism, then summarise four key theories important for this study, followed by a description of the Thai e-auction context, before stating the main research questions.

### **2.1 Electronic Auction**

Electronic auction (e-auction) is defined as a market institution with an explicit set of rules determining resource allocation and prices on the basis of electronically submitted bids from market participants (Beall et al. 2003). The term "auction" is used to represent both selling auctions (bidding to buy) and purchasing auctions (offering to sell) (Kaufmann & Carter 2004). The literature in e-auctions is usually discussed in terms of selling auctions, rather than purchasing auction, for simplification (Kaufmann & Carter 2004). The four basic selling auction types were introduced by McAfee and McMillan (1987): (1) the English auction (ascending-bid auction), (2) the Dutch auction (descending-bid auction), (3) the first-price sealed-bid auction, and (4) the second-price sealed-bid (Vickrey) auction. In the same way, Kaufmann and Carter (2004) suggested that the four selling auction types have mirror images in the context of purchasing auction: (1) reverse English auction, (2) the reverse Dutch auction, (3) the first-price sealed-bid purchasing auction, and (4) the second-price sealed-bid purchasing auction. Moreover, the auction types can generally be defined as the following dimensions: the number of bidders, the number of bids per bidder, and the degree of visibility between bidders (Kaufmann & Carter 2004). For this study, we employ only the first-price sealed-bid purchasing auction (with descending prices, multiple permitted bids and almost full visibility) because it has been used in the Thai e-auction. Thus, the terms "**e-auction**" used hereafter refer to "the first-price sealed-bid purchasing e-auction", which refers to the electronic competitive bidding between suppliers that drives prices down, or purchasing auctions from buyers.

### **2.2 B2G Electronic Auction Markets**

This paper is confined to the context of a B2G e-auction market as it pertains to a situation with one buyer (government) and a group of sellers (Kaufmann & Carter 2004). In B2G e-auction markets, a government procuring agency invites pre-qualified suppliers who compete against each other to supply a specified good or service, thus driving down the price. Governments generally find the e-auction process attractive because of the tangible benefit of price reductions and the prospect of a reduced transaction cost (Beall et al. 2003; Hackney et al. 2007; Settoon & Wyld 2003). Similarly, suppliers can obtain benefits from opportunities to bid electronically for new business, to penetrate new markets, to create new low costs sales channels, to lower overall transaction costs for buyers in e-auction markets (Smeltzer & Carr 2003), and also to obtain benefit from auction process time

reduction between bidding and winning the business (Smart & Harrison 2003). Sometimes the auction results are announced at the end of the event, or a day or two later versus weeks or months under traditional auction processes.

### 2.3 Relevant Theories

A number of relevant theories have been adopted for the theoretical development. These are explained in this section.

The **Motivation-Ability framework** was introduced by Merton (1957). It has also been applied in the marketing and strategic management literature to study organisation behaviour in terms of organisations' movement towards online channel. For example, Grewal et al. (2001) employed the motivation-ability framework to investigate organisational participation in business-to-business (B2B) e-markets, they also developed the efficiency construct from transaction cost economics, the legitimacy construct from the institutional theory, as well as the learning and IT capabilities from the Strategic Management literature. Son and Benbasat (2007) extend Grewal et al.'s (2001) work by identifying the salient factors rooted in efficiency motive and legitimacy motive, which affect organisation buyer's adoption and use of B2B e-marketplaces.

According to **Transaction Cost Economics (TCE)**, all economic activity revolves around a transaction, which is simply some form of exchange of a good or service between two or more economic actors. To optimize the exchange, an appropriate governance structures must be matched to the nature of the transaction (Williamson 1999). Consequently, transactions may be divided into production and coordination costs (Malone & Yates & Benjamin 1987). Coase (1937) proposed that the use of price mechanisms generates cost such as searching for prices, reaching an agreement and enforcing the commitments. In this research, transaction costs represent coordination costs, which consist of operational costs and contractual costs among economic actors in the market. If transaction costs are high, no or little economic activity from suppliers is likely to occur. Bakos (1991) pointed out that information technology would reduce transaction costs, thereby enabling the emergence of more efficiently organised electronic markets.

The **Institutional Theory** has been used to study organisations. Institutional environments are important for organisational structure and action (Son & Benbasat 2007; Teo & Wei & Benbasat 2003). The key idea behind institutionalization is that organisational action reflects a pattern of doing things that evolves over time and becomes legitimated within organisation and an environment (Eisenhardt 1988). DiMaggio and Powell (1983) suggested three types of isomorphic pressures - mimetic, coercive, and normative - that cause an organisation to have the same form with their environment (e.g. competitors or government/buyer). Mimetic pressures may cause an organisation to imitate the actions of other structurally equivalent, whereas coercive and normative pressures operate through interconnected relations (DiMaggio & Powell 1983).

The **Resource Based View (RBV)** of the firm suggests that organisations compete and create value on the basis of resources that are unique, rare, valuable, and not easily imitable or substitutable (Barney 1991). Competencies develop when such resources are combined to create specific organisational ability (Day 1994). Peteraf (1993) also proposed a resource-based model of the theoretical conditions which underlie competitive advantage, namely resource heterogeneity, ex post limits to competition, imperfect resource mobility, and ex ante limits to competition. Hall (1993) suggested the sources of sustainable competitive advantage as being two types of capability differential; namely, capabilities based on assets and capabilities based on competencies.

### 2.4 The Thai B2G E-Auction Markets

The Thai e-auction markets were introduced by the Thai government in 2002. The Thai B2G e-auction markets are highly decentralized. There is no central procuring authority or control agency, there is no purchasing department or the associated purchasing staff. Each of the Thai government agencies can

procure the goods, services through e-auction markets provided by third-party providers of e-auctions. However, the Prime Minister's Office (PMO) has authority to issue and update regulations that stipulate procurement procedures and standardized contracts in order to enforce all government procuring agencies and public enterprise to deploy transaction through e-auction markets. Given the authority of the different government administration units in mandating the strict electronic procurement practices of the Thai government, it leaves suppliers no choice but to comply with the set rules and regulations if they wish to expand their business to the government sectors.

The Thai government procuring agencies in B2G e-auction markets face a major problem pertaining to too few suppliers participating in these markets - this could result in a non-competitive electronic auction environment (NSO 2007). Smeltzer and Carr (2003) have suggested that at least four or five suppliers are needed to begin the bid process. Whereas, Elmaghraby (2005) argues that more bidders is not always better. These different views notwithstanding, it is important to understand the suppliers' behaviour to participate in the Thai B2G e-auction markets in order to facilitate these markets' success and to make these markets more competitive. Thus, the aims of this research are 1) to investigate the factors that influence suppliers' intention to participate and the level of participation in the Thai B2G e-auction markets and 2) to examine differential effect of the four groups of factors in participation intention and participation level. The main research questions to be addressed are;

1. What types of precursor factors motivate suppliers' intention to participate, and to increase their level of participation in B2G e-auction markets?
2. Do these key factors play different roles in explaining suppliers' intention to participate and participation level?

### **3 FRAMEWORK DEVELOPMENT**

In this section, we describe the theoretical development of a framework for explaining the factors that directly influence suppliers' participation in B2G e-auction markets. We theorise that suppliers' participation in a B2G e-auction market depends on a supplier's motivation and their capabilities. The literature on e-commerce also suggested that environmental uncertainty is inherent in e-markets (Lee & Clark 1997). We propose that four main constructs: efficiency motive, legitimacy motive, environmental uncertainty, and supplier capabilities - influence suppliers' participation (dependent variable) in B2G e-auction markets. Components of the proposed model (Figure 1) are explained below. While we recognise that independent variables may be interdependent to one another, the purpose of the current framework is an initial attempt to find the immediate antecedents of the dependent variable.

#### **3.1 Supplier Participation**

In e-auction markets, suppliers' participation can be classified into two groups; transaction intention and the level of participation (i.e. exploration, trial, commitment, and passive stage). A supplier firm can only be in one stage at any point in time (Grewal et al. 2001).

##### *3.1.1 Transaction Intention*

In the technology acceptance model and e-commerce literature, transaction intention is likely to influence future transaction behaviour (Davis 1989; Son & Benbasat 2007; Teo et al. 2003). Behavioural intention refer to the motivational factors that reflect how people are willing to try to undertake a behaviour (Ajzen 1991). In transaction intention period, suppliers will face higher levels of uncertainty related to evaluating the pros and cons of doing business through the B2G electronic auction market (Son & Benbasat 2007).

### 3.1.2 The level of Participation

To deal with the varying levels of supplier activities in B2G e-auction markets, the participation level can be classified into the exploration stage, the trial stage, the commitment stage, and passive stage (Grewal et al. 2001; Son & Benbasat 2007). In the **exploration stage**, the supplier has been registered in the B2G e-auction market but has not yet begun to conduct trading activities through the e-auction market. In the **trial stage**, the supplier will have conducted several transactions through a B2G e-auction market, but supplier is still evaluating the pros and cons of this means of doing business. In the **commitment stage**, the supplier has made a full commitment because trading through a B2G e-auction market has become an important part of its operations. In the **passive stage**, the supplier has considered not doing business or terminated conducting business in the B2G e-auction market.

Figure 1 shows the proposed research framework for B2G e-auction markets.

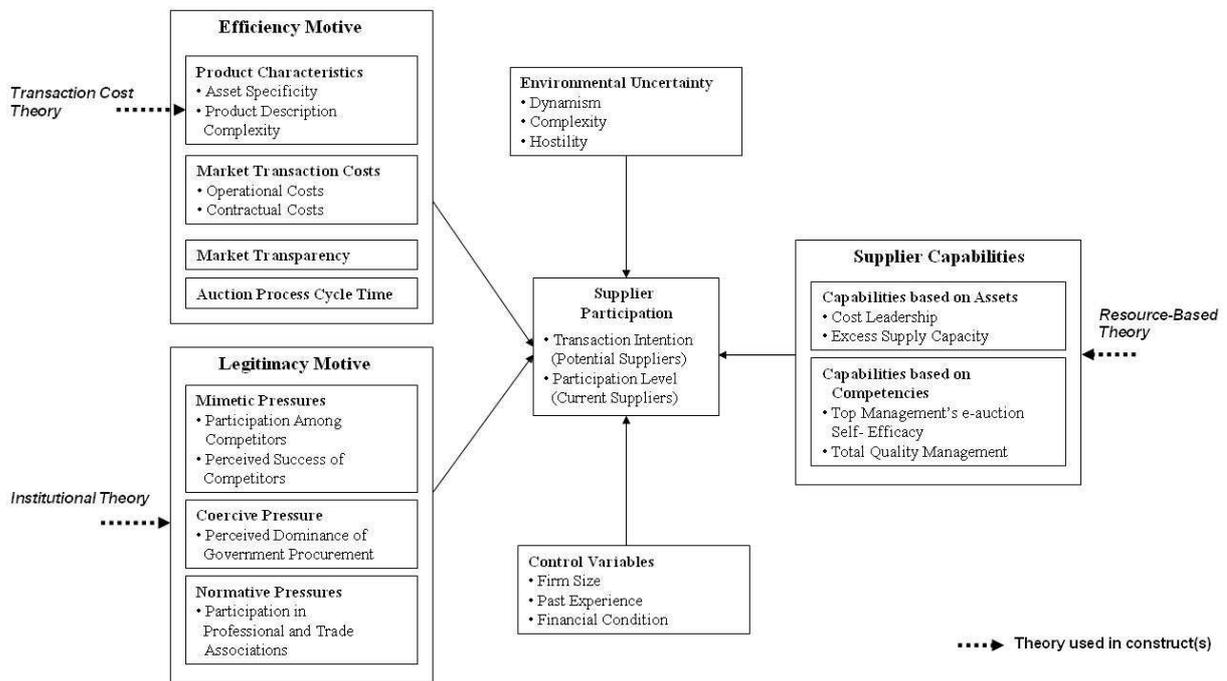


Figure 1. Research Framework for B2G E-Auction Markets.

### 3.2 Efficiency Motive

Organisations participating in e-commerce would be more tended to obtain both efficiency and effectiveness benefits (Bakos 1991). An e-market can reduce coordination costs, which include setting up a relationship, search costs, and transaction costs, between the buyers and the sellers (Bakos 1991). We draw from the Transaction Cost Theory to study the economic organisation of how suppliers seek to minimize transaction costs (Williamson 1981). Arguments for the move to e-markets were based on expected reduction in the transaction costs between buyers and sellers (Bakos 1991; Williamson 1981, 1999). Malone et al. (1987) proposed that information technology, by reducing the transaction costs of market-based coordination, will lead to increased use of market-based governance structures (such as B2G) than hierarchy-based governance structures (such as EDI). An organisation would choose one of these structures that best fits its economic efficiency rationale. Malone et al. (1987) provide two characteristics of products (i.e. asset specificity and product description complexity) which can influence an organisation to select one of governance structures between electronic markets and electronic hierarchies that minimize their total cost. This research also proposes additional variables that could potentially influence organisation decisions to participate in the e-auction markets; namely, market transaction costs, market transparency, and auction process cycle time.

### 3.2.1 *Product Characteristics*

Hackney et al. (2007) suggest that not all products are equally suitable for procuring through e-auction markets. Hur et al. (2007) also support this assertion and further suggest that not all products are auction-suitable and the commodities are most suitable for e-auction markets. The type of products directly impact on its specificity (Hackney et al. 2007) and product description complexity (Malone et al. 1987). Malone et al. (1987) proposed two characteristics of products (i.e. asset specificity and product description complexity) that influence suppliers to participate in a B2G electronic auction market. **Asset specificity** is the extent to which specialised investments are needed to support an exchange (Williamson 1981) or cannot be easily utilized by other firms (Malone et al. 1987). If products in the e-auction market have high asset specificity, suppliers tend not to participate in this market. **Product description complexity** refers to the amount of information necessary to describe the attributes of a product (Malone et al. 1987; Son & Benbasat 2007). If complex products are difficult to translate into unambiguous product description, suppliers tend not to participate in a B2G e-auction market.

Proposition 1: Product characteristics (high asset specificity and high complexity) in a B2G e-auction market will negatively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.2.2 *Market Transaction Costs*

E-markets offer facilities to support communicating information about price and production characteristics, and conducting transactions between buyers and sellers (Bakos 1991). E-markets can also help to reduce transaction costs that occur between buyers and suppliers (Bakos 1991). Market transaction costs is defined as the coordination costs involved in using an outside markets, comprising operational costs and contractual costs (Gurbaxani & Whang 1991). **Operational costs** refer to the costs for accessing market information and process transaction such as search costs and communication costs. **Contractual costs** refer to the costs of establishing and maintaining contractual relationships with outside parties, including costs of writing contracts and costs of enforcing contracts. We propose that the transaction costs that occur in B2G e-auction markets will negatively influence suppliers' intention to participate and the level of participation.

Proposition 2: High market transaction costs in a B2G e-auction market will negatively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.2.3 *Market Transparency*

Auction Market transparency is defined by Madhavan (2000) as "the ability of market participants to observe information about the trading process". Suppliers can make decisions to participate in trading through e-auction markets based on the available information regarding trading rule, price as well as information on the transaction process (Granados & Gupta & Kauffman 2006). More transparency in e-auction markets would help suppliers to reduce the information processing costs and opportunity costs of obtaining information about auction price and auction process.

Proposition 3: More information transparency in a B2G e-auction market will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.2.4 *Auction Process Cycle Time*

The use of traditional processes for government buying goods and service can consume several weeks or months (Beall et al. 2003; MacManus 1991). On the other hand, the use of e-auction markets can decrease auction process cycle times (Emiliani & Stec 2005), which are condensed into a period of a few hours (Beall et al. 2003). The cycle time reduction in B2G e-auction markets can benefit suppliers in that suppliers would be better able to plan production scheduling because time is reduced between bidding and winning the business (Beall et al. 2003), and suppliers also save costs in terms of a

reduction in negotiation time (Smeltzer & Carr 2003). We propose that the longer the auction process cycle time, the less willing suppliers are to participate in a B2G e-auction market.

Proposition 4: The longer auction process cycle time in a B2G e-auction market will negatively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.3 Legitimacy Motive

Much of the institutional literature emphasises that organisational structures and processes tend to become isomorphic with the accepted norms for organisations of particular types (DiMaggio & Powell 1983). According to RBV theory, isomorphism is often used as a mechanism for reducing uncertainty by organisations by adopting innovations (DiMaggio & Powell 1983). For example, Son and Benbasat (2007) studied how legitimacy-oriented factors, which are mimetic pressures, coercive pressure, and normative pressures, influence organisational buyers' adoption and use of B2B e-marketplaces. They found that two isomorphic processes; mimetic and normative pressures have significant effects on adoption intent, but not on participation level. While, coercive pressures did not significantly explain either adoption intent or the level of participation.

#### 3.3.1 *Mimetic Pressures*

As with Teo et al. (2003), we focus on two specific types of mimetic pressure: participation among competitors and perceived success of participated competitors. **Participation among competitors** refers to the participation level of competitors participating in B2G e-auction market. Whereas, **perceived success of participated competitors** refer to suppliers often closely monitoring their competitor to identify successful practices and imitate their actions to achieve similar benefits.

Proposition 5: Mimetic pressures in a B2G e-auction market will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

#### 3.3.2 *Coercive Pressures*

Coercive pressures is defined by DiMaggio and Powell (1983, p. 150) as "both formal and informal pressures exerted on organisations by other organisations upon which they are dependent and by cultural expectations in the society within which organisation function". These pressures may take several forms, such as force, threats, persuasion, and invitation (DiMaggio & Powell 1983). For example, the government is one of the largest customers of the supplier, and the supplier's well being may very much depend on whether it is being awarded the contract from the government. Thus, the purchasing volume from government can dominate a supplier firm's need to participate in B2G e-auction markets. We propose the effect of the perceived dominance of government procuring agencies on the supplier's intention to participate and the level of participation in a B2G e-auction market.

Proposition 6: Coercive pressures in a B2G e-auction market will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

#### 3.3.3 *Normative Pressures*

Normative pressures implies that strategic processes taken by organisations are subject to the values and norms shared among members of their social network (DiMaggio & Powell 1983). Normative pressures from participation in professional and trade associations may promote transactions through a B2G e-auction market. We posit that the effect of supplier participated in professional and trade associations on the supplier's intention to participate and the level of participation in a B2G e-auction market.

Proposition 7: Normative pressures in a B2G electronic auction market will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.4 Environmental Uncertainty

Organisational theories have suggested that organisations must adapt their environment to remain viable in business (Duncan 1972). The literature on the relationship between organisation and environment shows the link between these two variables. For example, Karimi, et al. (2004) show that managerial decision-making tasks are affected by rapid changes that occur in organisational task environments and that when confronted with environmental uncertainty. Lee and Clark (1997) also claimed that environmental uncertainty is inherent in e-markets. The literature has identified many different environment dimensions, three factors are viewed as particularly important (Kabadayi & Eyuboglu & Thomas 2007; Karimi et al. 2004; Newkirk & Lederer 2006) and have been included in a majority of e-commerce studies. They are dynamism, complexity, and hostility. This is also consistent with Duncan's work (Duncan 1972), which identifies dynamism and complexity as major sources of environmental uncertainty. **Dynamism** refers to the rate and unpredictability of environmental change. It is especially challenging for suppliers who need to participate in B2G e-auction markets. Researchers have measured dynamism in terms of the frequency of environmental change and the unpredictability of market factors (Homburg & Workman & Krohmer 1999; Kabadayi et al. 2007). **Complexity** refers to the number and diversity of competitors, suppliers, buyers, and other environmental actors that firm decision makers need to consider in formulating their strategies (Duncan 1972; Kabadayi et al. 2007). **Hostility** represents the availability of resources and the degree of competition (Newkirk & Lederer 2006) in e-auction markets. Hostility can be measured in terms of the threats to the supplier's firm posed by labor and material scarcity, intense competition in price, and product differentiation (Karimi et al. 2004; Newkirk & Lederer 2006).

Proposition 8: High environmental uncertainty in a B2G e-auction market will negatively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.5 Supplier Capabilities

This construct is mainly drawn from Resources-Based View Theory (RBV). In the strategic management literature, there is growing evidence that competitive advantage often depends on the firm's deployment of capabilities (Barney 1991; Day 1994; Wade & Hulland 2004). Thus, firm's capabilities enable a firm to compete more effectively in the marketplace (Day 1994). Coyne (1986) suggests that not only do the product and/or delivery system attributes need to be important to customers, a capability differential need to be significant for enduring sustainability. Suppliers with greater efficiency can develop sustainable competitive advantage by using this capability to reduce costs and develop a cost leadership position in their industry (Burney 1991; Porter 1985). Hall (1993) suggests that two types of supplier capabilities – capabilities based on assets and capabilities based on competencies - could influence supplier to gain competitive advantage in markets.

#### 3.5.1 Capabilities based on Assets

We propose two sub-constructs that can influence suppliers to participate in B2G e-auction markets. Economies of scale and excess production capacity would be used as sources for suppliers' competitive advantage in B2G e-auction markets (Elmaghraby 2005). **Cost leadership** refers to a supplier can gain sales by offering product and/or services at a price that is low than that of competitors as well as pursuing economies of scale in production. Suppliers can produce goods at low cost only if they produce in large quantities. For example, the government provides a large purchasing volume through a B2G e-auction markets which induces a supplier, who has economies of scale (i.e. cost for producing a second unit is less than cost for producing the first unit) to supply goods or services at a small cost than its competitors. **Excess supply capacity** infers a supplier may differ in its supply capacity. Excess supply capacity can be used to supply products and services as supplier's competitive advantage in order to pursue additional business (Elmaghraby 2005; Smeltzer & Carr 2003). If excess capacity exists in the supply base, a supplier can allocate this valuable resource in an

e-auction market (Jap 2002). For instance, when supplier's excessive capacity exists, supplier tend to participate in a B2G e-auction market.

Proposition 9: Capabilities based on assets of supplier will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

### 3.5.2 *Capabilities based on Competencies*

Hall (1993) proposed two types of capabilities based on competencies which can be the sources of sustainable competitive advantage, namely, functional capability (i.e. top management's IT self-efficacy) and cultural capability (i.e. total quality management). In the context of B2G e-auction markets, **top management's IT self-efficacy** refers to the perceptions of the owner and/or CEO of supplier to use IT in the accomplishment of a task (Bandura 1986; Compeau & Higgins 1995). This definition is based on the concept of self-efficacy defined as "people's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with judgments of what one can do with whatever skills one possesses" (Bandura 1986, p.391). For example, top management can use his/her ability to manipulate e-auction system provided by third-party providers of e-auctions. Hulland et al. (2007) also found that the organisation which had a strong IT skill capability was positively influenced to commit to the online channel. **Total quality management (TQM)** refers to the continuous improvement of work processes to enhance the organisation's ability to deliver high-quality product or services in a cost-effective manner (Beer 2003). Supplier's firms that implement TQM are better positioned to gain through lowered costs and improved customers' satisfaction (Beer 2003). In addition, Powell (1995) found that TQM can produce economic value; and it can also be used as a potential source of sustainable competitive advantage for suppliers' firm.

Proposition 10: Capabilities based on competencies of supplier will positively influence supplier's intention to participate and the level of participation in the B2G e-auction market.

## 4 CONCLUSION

In this paper, we have attempted to derive a theoretical framework for explaining supplier behaviours in a B2G e-auction context, by drawing from multiple disciplines. The outcome is derived from extensive and rigorous literature review. It is anticipated that the examination of four key constructs; efficiency motive, legitimacy motive, environmental uncertainty, and supplier capabilities will help to identify reasons for suppliers' decision to participate in B2G e-auction markets in Thailand. Overall, we believe that this paper extends the understanding of supplier behaviours in the B2G e-auction markets. We also hope that the outcome of this study encourages new thinking and research into the B2G e-auction markets. Future steps include qualitative interviews and focus groups with suppliers in the Thai B2G e-auction markets. These techniques will uncover empirical evidence for possible relationships amongst the independent variables specifically addressing the Thai context and therefore help us refine the theoretical model. Based on the improved model, we will develop survey instruments, followed by pre-test of the instruments, the main survey, and follow-up interviews (if necessary) to explore unexplained results.

## References

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Bakos, J.Y. (1991). A Strategic Analysis of Electronic Marketplaces. *MIS Quarterly*, 15(3), 295-310.
- Bandura, A. (1986). *Social Foundations of Thought and Action*. New Jersey: Prentice-Hall.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120.

- Beall, S., Carter, C., Carter, P.L., Germer, T., Hendrick, T., Jap, S., Kaufmann, L., Maciejewski, D., Monczka, R. and Petersen, K. (2003). The Role of Reverse Auctions in Strategic Sourcing. In S. Beall (Ed.): CAPS RESEARCH.
- Beer, M. (2003). Why Total Quality Management Programs Do Not Persist: The Role of Management Quality and Implications for Leading a TQM Transformation. *Decision Sciences*, 34(4), 623-642.
- Coase, R.H. (1937). The Nature of the Firm. *Economica*, 4(16), 386-405.
- Compeau, D.R. and Higgins, C.A. (1995). Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, 19(2), 189-211.
- Coyne, K.P. (1986). Sustainable Competitive Advantage - What It Is, What It Isn't. *Business Horizons*, January-February, 54-61.
- Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340.
- Day, G.S. (1994). The Capabilities of Market-Driven Organizations. *Journal of Marketing*, 58, 37-52.
- DiMaggio, P.J. and Powell, W.W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147-160.
- Duncan, R.B. (1972). Characteristics of Organizational Environments and Perceived Environmental Uncertainty. *Administrative Science Quarterly*, 17(3), 313-327.
- Eisenhardt, K.M. (1988). Agency- and Institutional-Theory Explanations: The Case of Retail Sales Compensation. *The Academy of Management Journal*, 31(3), 488-511.
- Elmaghraby, W. (2005). The Effect of Asymmetric Bidder Size on an Auction's Performance: Are More Bidders Always Better? *Management Science*, 51(12), 1763-1776.
- Emiliani, M.L. and Stec, D.J. (2002). Realizing Savings from Online Reverse Auctions. *Supply Chain Management: An International Journal*, 7(1), 12-23.
- Emiliani, M.L. and Stec, D.J. (2005). Wood Pallet Suppliers' Reaction to Online Reverse Auctions. *Supply Chain Management: An International Journal*, 10(4), 278-288.
- Germer, T., Carter, C.R. and Kaufmann, L. (2004). In *Purchasing Auction - A Synthesis of Current Research* (pp. 119-139). Paper presented at the Proceedings of The 15th Annual North American Research Symposium on Purchasing and Supply Management, Tempe, AZ, USA.
- Granados, N.F., Gupta, A. and Kauffman, R.J. (2006). The Impact of IT on Market Information and Transparency: A Unified Theoretical Framework. *Journal of the Association for Information Systems*, 7(3), 148-178.
- Grewal, R., Comer, J.M. and Mehta, R. (2001). An Investigation into the Antecedents of Organizational Participation in Business-to-Business Electronic Markets. *Journal of Marketing*, 65(3), 17-33.
- Gurbaxani, V. and Whang, S. (1991). The Impact of Information Systems on Organizations and Markets. *Communications of the ACM*, 34(1), 59-73.
- Hackney, R., Jones, S. and Lösch, A. (2007). Towards an e-Government efficiency agenda: the impact of information and communication behaviour on e-Reverse auctions in public sector procurement. *European Journal of Information Systems*, 16, 178-191.
- Hall, R. (1993). A Framework Linking Intangible Resources and Capabilities to Sustainable Competitive Advantage. *Strategic Management Journal*, 14(8), 607-618.
- Homburg, C., Workman, J.P. and Krohmer, J.H. (1999). Marketing's Influence within the Firm. *Journal of Marketing*, 63(2), 1-17.
- Hulland, J., Wade, M.R. and Antia, K.D. (2007). The Impact of Capabilities and Prior Investments on Online Channel Commitment and Performance. *Journal of Management Information Systems*, 23(4), 109-142.
- Hur, D., Mabert, V.A. and Hartley, J.L. (2007). Getting the most out of reverse e-auction investment. *Omega*, 35, 403-416.
- Jap, S.D. (2002). Online Reverse Auctions: Issues, Themes, and Prospects for the Future. *Journal of Academy of Marketing Science*, 30(4), 506-525.
- Jones, D.S. (2007). Public Procurement in Southeast Asia: Challenge and Reform. *Journal of Public Procurement*, 7(1), 3-33.

- Kabadayi, S., Eyuboglu, N. and Thomas, G.P. (2007). The Performance Implications of Designing Multiple Channels to Fit with Strategy and Environment. *Journal of Marketing*, 71, 195-211.
- Karimi, J., Somers, T.M. and Gupta, Y.P. (2004). Impact of Environmental Uncertainty and Task Characteristics on User Satisfaction with Data. *Information Systems Research*, 15 (2), 175-193.
- Kaufmann, L. and Carter, C.R. (2004). Deciding on the Mode of Negotiation: To Auction or Not to Auction Electronically. *The Journal of Supply Chain Management: A Global Review of Purchasing and Supply*, May, 15-26.
- Lee, H.G. and Clark, T.H. (1997). Market Process Reengineering through Electronic Market Systems: Opportunities and Challenges. *Journal of Management Information Systems*, 13(3), 113-136.
- MacManus, S.A. (1991). Why Businesses are Reluctant to Sell to Governments. *Public Administration Review*, 51(4), 328-344.
- MacManus, S.A. (2002). Understanding the Incremental Nature of E-Procurement Implementation at the State and Local Levels. *Journal of Public Procurement*, 2(1), 5-28.
- Madhavan, A. (2000). Market Microstructure: A Survey. *Journal of Financial Markets*, 3, 205-258.
- Malone, T.W., Yates, J. and Benjamin, R.I. (1987). Electronic Markets and Electronic Hierarchies. *Communications of the ACM*, 30(6), 484-497.
- Merton, R.K. (1957). *Social Theory and Social Structure*. Glencoe, IL: The Free Press.
- Molla, A. and Licker, P.S. (2005). eCommerce Adoption in Developing Countries: A Model and Instrument. *Information & Management*, 42, 877-899.
- Newkirk, H.E. and Lederer, A.L. (2006). The Effectiveness of Strategic Information Systems Planning Under Environmental Uncertainty. *Information & Management*, 43, 481-501.
- NSO. (2007). A Survey: Perception of Government Procuring Agencies using e-Auction in Thailand: National Statistics Organization of Thailand.
- Peteraf, M.A. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal*, 14(3), 179-191.
- Powell, T.C. (1995). Total Quality Management as Competitive Advantage: A Review and Empirical Study. *Strategic Management Journal*, 16(1), 15-37.
- Rege, V. (2001). Transparency in Government Procurement: Issues of Concern and Interest to developing Countries. *Journal of World Trade*, 35(4), 489-515.
- Settoon, R.P. and Wyld, D.C. (2003). The Ski Slope to Prosperity: An Analysis of the Potential Impact of Reverse Auctions in Government Procurement in Five Southeast Asian Nations. *Asia Pacific Journal of Marketing and Logistics*, 15(3), 3-19.
- Smart, A. and Harrison, A. (2003). Online Reverse Auctions and Their Role in Buyer-Supplier Relationships. *Journal of Purchasing & Supply Management*, 9, 257-268.
- Smeltzer, L.R. and Carr, A.S. (2003). Electronic reverse auctions: Promises, risks and conditions for success. *Industrial Marketing Management*, 32, 481-488.
- Soh, C., Markus, M.L. and Goh, K.H. (2006). Electronic Marketplaces and Price Transparency: Strategy, Information Technology, and Success. *MIS Quarterly*, 30(3), 705-723.
- Son, J.-Y. and Benbasat, I. (2007). Organizational Buyers' Adoption and Use of B2B Electronic Marketplaces: Efficiency-and Legitimacy-Oriented Perspectives. *Journal of Management Information Systems*, 24(1), 55-99.
- Teo, H.H., Wei, K.K. and Benbasat, I. (2003). Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective. *MIS Quarterly*, 27(1), 19-49.
- UN. (2005). UN Global E-Government Readiness Report 2005: From E-Government to E-inclusion. In D.o.E.a.S. Affairs' (Ed.): United Nations Publication.
- Wade, M. and Hulland, J. (2004). Review: The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research. *MIS Quarterly*, 28(1), 107-142.
- Williamson, O.E. (1981). The Economics of Organization: The Transaction Cost Approach. *The American Journal of Sociology*, 87(3), 548-577.
- Williamson, O.E. (1999). Strategy Research: Governance and Competence Perspectives. *Strategic Management Journal*, 20(12), 1087-1108.