Chapter: 2
Literature Review
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LITERATURE REVIEW

E-Procurement is growing in its scope and importance. Procurement activities on the Internet encourage a dramatic decrease in procurement costs, making skill-independent procurement negotiation possible and increasing supplier availability.

2.1 Review on factors affecting the adoption of E-Procurement

The adoption of E-Procurement is highly influenced by the level of understanding about the benefits (not only financial, but also non-financial) of E-Procurement in a company. If no one is aware of the benefits of E-Procurement there is little incentive to adopt E-Procurement. An understanding of the benefits of E-Procurement indicates the level of managerial and technological expertise and awareness of new technologies, including E-Procurement.

The major benefits associated with adoption of E-Procurement are real-time information, a flawless procurement process and integrated supply chain. The benefits that can be draw after implementing E-Procurement include improved relationships with supplier, improved purchasing effectiveness, less inventory carrying cost, better price and shorter order cycle time. Gunasekaran, et al. (2009)

Latif Al-Hakim, et al. (2012) carried out survey among manufacturers across different industries in Malaysia to investigate the impact of inter-organization trust and dependency on E-Procurement adoption decisions. Authors concluded that dependency, interaction between trust and dependency, and size of company have a strong impact on the adoption decisions while trust has only a modest effect.

Eei, et al. (2012) Surveyed the existing literature on benefits and barriers of E-Procurement in the perspective of Malaysian SMEs. The authors have identified three groups of external barriers technology, infrastructure and legislation, and environment. Meanwhile resource constraints and organizational characteristics form the two groups of internal barriers impeding adoption of E-Procurement.

G. Bala Sendhil Kumar, et al. (2012) proposed a model of electronic procurement adoption which portraits the role & influence of supplier. The various constructs of
the proposed of model are power of supplier, trust on supplier, pressure of supplier & buyers, pressure from supplier, supplier & buyer relationship, supplier participation, supplier involvement, supplier support & dependency on supplier.

Thompson, et al. (2009) Surveyed the Adopters and non-adopters of E-Procurement in Singapore. Out of the total 141 respondent organizations, 87 are adopters of e-procurement while the remaining 54 organizations are non-adopters. Using Technology–organization–environment (TOE) framework examined the following factors: perceived direct benefits, perceived indirect benefits, perceived costs, firm size, top management support, information sharing culture and business partner influence. With E-Procurement adoption as dependent variable and using logistic regression analysis found that the key factors affecting the adoption of e-procurement in order of importance are perceived indirect benefits, firm size, business partner influence, and top management support.

**Figure 2.1**: Technology–organization–environment (TOE) framework research model for E-Procurement adoption.

Source: Thompson, et al. (2009)
Gunasekaran, et al. (2009), carried out a survey among the small and medium-sized enterprises (SMEs) located in the south coast of Massachusetts to understand the current state of E-Procurement in SMEs. Examined how the following factors current status and readiness of company for E-Procurement, perceived benefits of E-Procurement, perceived barriers to E-Procurement implementation, perceived future organizational performance with E-Procurement and critical success factors in E-Procurement affect the adoption of E-Procurement by SMEs located in the south coast of Massachusetts.

Through this study, the author found that SMEs on the South coast of Massachusetts were not embracing E-Procurement, even though a substantial number of them seem to realize its strategic value and appreciate the potential impact on organizational performance. Current status and readiness of company for E-Procurement, perceived benefits of E-Procurement did not seem to be the primary issue thwarting adoption. The most important barrier was that E-procurement was not a top management initiative or priority.

**Figure 2.2**: Theoretical framework for the adoption of E-Procurement by SME’s in the South Coast of Massachusetts.

Source: Gunasekaran, et al. (2009)
LI.Yu-hui, (2008) Conducted an empirical investigation to identify the factors that impact the adoption of E-Procurement in Chinese manufacturing enterprises. The author examined the relationships between the technological, organizational and environmental characteristics and the enterprises’ adoption of E-Procurement using logistic regression technique. Through this empirical investigation the author concluded that the relative advantage, top management support, external pressure and external support are major determinant factors for the successful adoption of E-Procurement by Chinese manufacturing enterprises. The author also emphasis that the technology-organization-environment framework postulated in the research work does not capture inter-organizational factors such as trust and trading partner readiness, which may be important drivers of the E-Procurement adoption, and which have been examined in several researches on inter-organizational information system (IOS) adoption.

Figure 2.3: E-Procurement Adoption Decisions by Chinese Manufacturing Enterprises.
Source: LI.Yu-hui, (2008)

Aguiar, et al. (2008) proposed an integrative model to explain the implementation success of electronic procurement system (EPS) and found that it is mainly determined by EPS Project Management process, the firm’s Absorptive Capacity, and
it’s IT Competence. Further the author argues that the Systems Integration between the focal firm and its main suppliers moderates the relationship between EPS Implementation Success and the Procurement Performance achieved by the firm.

Purchase, et al. (2005) proposed a model of factors influencing the adoption of E-Procurement systems within Australian organizations. To examine the relationship between buyer perceptions and the factors that influence E-Procurement adoption carried out a survey with the purchasing professionals of the Australian Institute of Purchasing and Materials Management (AIPMM) and Queensland Purchasing (a state government department). The author concludes that supplier participation and perceptions of task improvements/convenience have a direct influence on adoption of E-Procurement.

Chan, et al. (2002) proposed a model of E-Procurement adoption behavior by Small-to Medium-sized Enterprises (SME). The authors examined the proposed model from the perspective of buyer-seller relationship and concluded that the value of E-Procurement adoption, trust on supplier, trust on Information Technology, power of E-Procurement and power of suppliers are the most important determinant factors of E-Procurement implementation in Hong Kong. In addition to this the author suggested that intermediary organizations such as E-Marketplace can play a vital role by demonstrating the benefits of E-Procurement to the SME’s. The author also advocates that trust on the information technology is going to play an important role in adoption of E-Procurement; hence intermediary organizations such as E-Marketplace carry out some measures to build their trust on the technology application (e-marketplace). The government should also provide various supportive measures such as enacting electronic commerce regulations and laws, educating the SME’s on the issues pertaining to electronic commerce adoption, providing subside, and building better telecommunications infrastructure.
TABLE 2.1: Factors affecting E-Procurement adoption.

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<thead>
<tr>
<th>Factors</th>
<th>Literature</th>
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</thead>
<tbody>
<tr>
<td>Task improvements and</td>
<td>Croom and Brandon-Jones 2004; Min and Galle 2003;</td>
</tr>
<tr>
<td>Convenience</td>
<td>Panayiotou, Gaylialis and Tatsiopoulos 2004; Kauffman and Mohtadi 2004;</td>
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<td>Ellram and Zsidisin 2002; Subramanian and Shaw 2002; Turban et al 2004;</td>
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<td></td>
<td>Dooley and Purchase 2005; Osmonbekov et al 2002</td>
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<tr>
<td>Cost savings</td>
<td>Subramanian and Shaw 2002; Croom and Brandon-Jones 2004;</td>
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<td></td>
<td>Ellram and Zsidisin 2002; Kauffman and Mohtadi 2004</td>
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<td>and environment</td>
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2.2 Reviews on Simulation of E-Procurement Process and Supply Chain.

Peter Trkman, et al. (2009) presented a methodological approach to the measure the risks and benefits of implementing E-Procurement, Using Business process simulation analyzed the benefits of both technological and organizational changes related to E-Procurement.

C. Caballini, R. Revetria (2008) modeled a non multi echelon supply chain using system dynamics approach, to optimize the inventory levels so to reduce the bullwhip
effect and consequently minimize the supply chain costs. The proposed supply chain consisted of five stages – customer, retailer, wholesaler, distributor and factory. The authors tested the effect of two different kinds of delays information processing delays and material delays. They concluded that increased delays require closer control of the inventories and Information distortion within the supply chain is a major internal cause of the bullwhip effect.

J.P.C. Kleinjen (2005) in his paper provides a survey of simulation in supply chain management and reviews four types of simulation, namely spreadsheet simulation, system dynamics, discreet event simulation, and business games. He summarizes novel sensitivity and robustness analysis. Kleijnen distinguishes four simulation types for SCM: Spreadsheet simulation, System dynamics (SD), Discrete-event dynamic systems (DEDS) simulation and Business games.

Jessica Ho, et al. (2002) proposed a framework to guide an organization on the selection of an appropriate e-business model(s) to be used when a particular company/supply chain seeks to move from its current stage of operation to an Internet-based operation. Using system dynamics simulation Modelling technique evaluated the benefit of deploying the e-business model(s) to the organization or supply chain.

Vesna Bosilj-Vuksic, et al. (2002) investigated how business process simulation can be used as tool for understanding in-depth how the process is executed and also identify the sources of the problems during the process execution. The authors presented an example how simulation Modelling can be used to understand procurement process and evaluate the procurement performance after electronic business being introduced into the procurement process.