



E-Procurement Practices: An Australian Survey

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ABSTRACT

The role of procurement and the emerging use of large information systems to conduct e-procurement is analysed and presented with the results of a survey of 38 major Australian organisations. The current direct and indirect procurement practices of the sample organisations will be analysed together with an analysis of the e-procurement drivers and barriers. The main results show that direct procurement is heavily dependant upon traditional practices whilst indirect procurement is more likely to use "e" practices. Technical issues dominate e-procurement barriers with cost factors dominating e-procurement drivers.

INTRODUCTION

The supply chain process of procurement is now getting the "e" treatment. Many companies are looking at e-procurement to increase efficiencies and decrease the bottom line. E-procurement is evolving as one of the shining lights in the evolving e-business story and this paper will look at a research survey of Australian organisations to determine the e-procurement practices of a sample of Australian organisations.

The Supply Chain

The supply chain and supply chain management has become the focus for software vendors developing large software suites that span entire organisations. Definitions of supply chain management are varied and can be based on the process, management philosophy or management process (Tyndall et al, 1990). Mentzer et al (2001) defines the supply chain as:

"a set of three or more entities directly involved in the upstream and downstream flows of products, services, finances and or information from a source to a customer." (Mentzer et al, 2001)

In developing a supply chain model Mentzer et al (2001) includes purchasing, logistics and procurement as inherent supply chain processes and goes further by extolling the advantages of superior supply chains being cost control, improved customer value and competitive advantage.

e-Procurement

Traditionally procurement has involved a number of communication mediums to facilitate procurement process between the various parties. E-procurement includes

"the use of electronic technologies to streamline and enable the procurement activities of an organisation." (OGO, 1999)

These electronic technologies have included the use of mail, phone, fax, EDI and more recently email and the internet.

Information systems that support e-procurement can be classified into four major segments; buy-side applications, sell-side applications, e-marketplace applications and content applications (IDC, 2001a). The major vendors in the e-procurement market include the leading ERP vendors (SAP, Oracle, Peoplesoft) and a number of specialist procurement vendors (Ariba, Commerce One, i2). The Australian e-procurement market is expected to grow to \$99 million in 2005 (IDC, 2001b).

e-Procurement Practices

An Aberdeen report (Aberdeen, 2001) divides e-procurement technologies into three categories:

- Indirect Procurement: This includes the procurement of non-production goods and services such as office supplies, printing, advertising and casual labour.
- Direct procurement: This includes the procurement of raw materials, parts and assemblies used Supply chain (ie. organisation & management of raw materials, parts and assemblies).
- Sourcing (ie. identification, evaluation, negotiation of products and supplies for both the indirect and direct supply chain).

There is a plethora of literature espousing the benefits of an e-procurement solution (Aberdeen, 2001; NOIE, 2001; NOIE, 2000a; NOIE, 2001b; IDC, 2001a;). These benefits would be identified as drivers for any implemented solution. They include:

- Price reduction
- Improved contract compliance
- Shortened Proc cycle times
- Reduced administration costs
- Enhanced inventory management
- Improved visibility of cust demand
- Improved visibility of supply chain
- Reduced op & inventory costs
- Shortened proc cycle times
- Negotiated unit cost reduction
- Increased accuracy of prod capacity
- Enhanced decision making
- Improved market intelligence

Whilst drivers form the basis of business cases and provide a measure for success it is important to consider the possible barriers companies may experience when adopting an e-procurement solution. A summary of these barriers as identified in the literature appear below (Table 1):

Table 1: e-Procurement Barriers

Factor	Reference
Security of transactions	Gebaur et al, 1998; PWC, 2002; Boston Consulting, 2002
Lack of Supplier e-procurement solution	PWC, 2002; Gebauer et al, 1998; Boston Consulting, 2002
High cost of technology	PWC, 2002
Lack of legal framework	PWC, 2002
Lack of technical expertise	PWC, 2002
Lack of e-Procurement knowledge	PWC, 2002; Gebauer et al, 1998; Boston Consulting, 2002
No real business benefit identified	PWC, 2002; Gebauer et al, 1998; Boston Consulting, 2002
Data exchange standards lacking	PWC, 2002
Lack of business relationships with suppliers	PWC, 2002

The identified drivers and barriers focus on different aspects of the procurement process. They can be classified as having a; Cost focus (C), Strategic focus (S), Supplier Relationship focus (R), Internal Organisational focus (I), Technological focus (T), Enhanced internal company efficiency focus (E), or External focus (Ex). A summary of the drivers and barriers and their corresponding focus appears below (Table 2).

Table 2: Drivers and Benefits e-Procurement Categorisation

Driver	Focus	Barrier	Focus
Price Reduction	C	Inadequate Technological Infrastructure	T
Negotiated Unit Cost reduction	C	Lack of Skilled Personnel	T
Improved Visibility of Customer Demand	S	Inadequate Tech Infrastructure of partners	T
Reduced Administration Costs	C	Lack of Integration with Business Partners	T
Improved Market Intelligence	S	Implementation Costs	C
Reduced Operational & Inventory Costs	C	Company Culture	I
Enhanced Decision making	S	Inadequate Business Processes to support e-Procurement	I
Improved Contract Compliance	R	Regulatory and Legal Controls	Ex
Shortened Procurement Cycle Times	I	Security	T
Improved Visibility of Supply Chain Management	R	Co-operation of Business Partners	R
Increased Accuracy of Production Capacity	E	Inadequate e-procurement Solutions	I
Enhanced Inventory Management	E	Upper Management Support	I

Cost is the primary focus of drivers whilst technology and business partner integration are the main focus of barriers. From Table 2 a master list of drivers and barriers was developed and used in the survey research.

RESEARCH QUESTIONS

The primary objective of the study was to survey a range of information system professionals and seek responses to issues including the current and future procurement practices taking place and to further ascertain their intentions to enter the e-marketplace model. More specifically the research questions of the paper are:

- RQ1. What are the current direct and indirect procurement practices of the sample organisations?
 RQ2. What are the e-procurement drivers and barriers of the sample organisations?

METHODOLOGY

The research questions were studied by gathering data in a survey of those information system professionals listed as working within a cross-section of the Australian marketplace. The SAP Australian User Group(SAUG) commissioned this research to provide added value to their members and to contribute to the ERP research base in Australia. The user group lists many of Australia's leading companies as its members and represents approximately 50% of the SAP customers. The key contact details for each member company (166) were provided to the researchers for the purpose of this study. The web based survey instrument was developed based on the fields that were identified in the literature. The use of an email directing the respondent to a web site was used with the initial web direction being sent to 166 user group members. It was necessary to pre-empt the email address book to remove and amend email that had bounced back.

RESULTS

Survey Instrument

The survey instrument had 30 questions covering three areas; demographics, e-procurement practices and e-marketplace practices and intentions. Closed questions were used with Yes/No and five point Likert scale responses. Open-ended questions sought responses from the cohort allowing for qualitative data to be collected. The overall response

rate once removing the undeliverable addresses was 26% (38).

Demographics

Responses were analysed in regard to; present position, organisation type, organisation size and procurement spend. Respondents were predominantly high in the organisational structure being either an IS or business managers. They were from organisations that spanned most sectors of the Australian marketplace. Respondents came from all spectrums of business as determined by organisation spend. The organisations were further classified as small-medium or medium-large. The Australian Government classifies small-medium organisations as having revenue of less than \$AUD250 million. This classification will be used to analysis the procurement of the sample organisations.

Procurement Practices

Organisations reported their current (Table 3.) and intended methods of direct & indirect procurement with the fax dominating direct procurement practices. Mail based procurement also showed moderate results with EDI and Internet showing low results. The major differences between small-medium and medium-large is the use of the fax and EDI to conduct e-procurement. Small-medium organisations do not use the fax as heavily as the medium-large organisation but are heavier users of EDI and the internet. There was no discernable trend in direct procurement trends over the next twelve months. Indirect procurement, as shown in Table 3, replicates the direct procurement trend of heavy reliance upon fax and with a decreased reliance upon paper/mail. The small-medium organisations showed increased reliance upon the telephone and the Internet to conduct indirect procurement. The small-medium organisations signalled a trend away from fax/phone/mail procurement to the electronic methods. There was a definite trend towards internet enabled procurement for the entire cohort over the next 12 months with an increase from 10% to 15%.

Table 3: Direct and Indirect Procurement Trends (%)

Direct Current	Whole Cohort	Small Medium	Medium Large	Direct 12 Months	Whole Cohort	Small Medium	Medium Large
	%	%	%		%	%	%
Fax	49	33	57	Fax	45	28	54
Mail	28	31	29	Pap/Mail	26	31	25
Telephone	5	9	2	Telephone	4	8	1
Email	5	5	5	Email	7	7	6
EDI	8	13	5	EDI	10	14	7
Internet	5	9	2	Internet	7	8	6

Indirect Current	Whole Cohort	Small Medium	Medium Large	Indirect 12 Months	Whole Cohort	Small Medium	Medium Large
	%	%	%		%	%	%
Fax	47	41	50	Fax based	43	38	46
Mail	18	15	20	Mail	14	10	17
Telephone	15	21	11	Telephone	11	14	9
Email	7	7	7	Email	9	10	8
EDI	2	0	4	EDI	6	5	6
Internet	10	16	8	Internet	15	18	13

Drivers

Respondents were supplied with a list of e-procurement drivers and were asked to identify the 5 most important and then rank them. (5: most important, 1: least important). A summary of the results is displayed in Table 4. Respondents had the opportunity to identify other e-procurement drivers that they considered important. Identified were; enhanced service delivery, leveraging the business group, reduce "maverick" purchases, and better management information reports.

Barriers

Respondents were supplied with a list of e-procurement barriers and were asked to identify the 5 most important and then rank them. (5: most important, 1: least important). A summary of the results is displayed in Table 5. Technical issues dominated the barriers. Infrastruc-

Table 4: e-Procurement Drivers

e-Procurement Drivers	Focus	Mean	SD
Price Reduction	C	3.70	1.3
Negotiated Unit Cost reduction	C	3.32	1.5
Improved Visibility of Customer Demand	S	3.22	1.5
Reduced Administration Costs	C	3.21	1.5
Improved Market Intelligence	S	3.17	1.7
Reduced Operational & Inventory Costs	C	2.87	1.1
Enhanced Decision making	S	2.75	1.1
Improved Contract Compliance	R	2.72	1.3
Shortened Procurement Cycle Times	I	2.71	1.3
Improved Visibility of Supply Chain Management	R	2.70	1.4
Increased Accuracy of Production Capacity	E	2.63	1.3
Enhanced Inventory Management	E	2.30	1.3

ture, integration, technically skilled staff and the degree of technical infrastructure of business partners all point to massive uncertainty in the technical elements of e-procurement. Internal organisational issues were not rated as highly as the technical issues.

Table 5: e-Procurement Barriers

e-Procurement Barriers	Focus	Mean	SD
Inadequate Technological Infrastructure	T	3.3	1.4
Lack of Skilled Personnel	T	3.2	1.4
Inadequate Technological Infrastructure of Business partners	T	3.2	1.5
Lack of Integration with Business Partners	T	3.2	1.1
Implementation Costs	C	3.1	1.5
Company Culture	I	3.0	1.2
Inadequate Business Processes to support e-Procurement	I	2.9	1.5
Regulatory and Legal Controls	Ex	2.8	2.0
Security	T	2.8	1.3
Co-operation of Business Partners	R	2.8	1.1
Inadequate e-procurement Solutions	I	2.7	1.6
Upper Management Support	I	2.3	1.2

DISCUSSION

The results show that traditional procurement practices like fax/mail/phone dominate both direct and indirect procurement in the sample organisations. As the sample is a cross-section of major Australian organisations we can generalise and suggest that Australian business is

slow at the uptake of e-procurement. Looking 12 months out the organisations indicate a move to “e” practices with indirect procurement being stronger than direct procurement. This trend with indirect procurement being more able to adopt e-procurement could be facilitated by the penetration into the marketplace by e-marketplaces. Direct procurement being closer to the core business process is more likely to follow and will be encouraged by the use of e-procurement by major Australian organisations.

The results indicated that the main e-procurement drivers were cost related and were tactical in nature. This is possibly due to the maturity of the e-procurement solutions within the respondent companies. Companies in the early stages of e-procurement would tend to identify drivers that were cost related, as they are easier to measure and quicker to realise. More strategic drivers such as improved visibility of customer demand, market intelligence and enhanced decision making even though they were rated highly are more difficult to quantify. The drivers that were ranked the lowest were closely related to the supply chain. This would be expected as analysts predict that some of the major benefits with e-procurement would be attained in relation to indirect procurement.

The top four barriers are infrastructure, technology and integration based. This seems to indicate that the complex technological issues both within and between organisations in the procurement process are crucial. The ratings of cost issues, upper management support and inadequate e-procurement solutions would indicate that companies are willing to pursue e-procurement solutions but are hindered by external factors, business partners and lack of skilled personnel. However this may also be an indication of the e-procurement maturity of the sample.

CONCLUSION

The research identified the “state of play” of procurement practices in Australia. It identified a number of barriers and drivers for e-procurement and then assessed the strength of these factors in the Australian marketplace. This study was the first stage of a wider research study on e-procurement in the Australian marketplace. Several additional study areas emerged including the extent that drivers and barriers change of the life cycle of the e-procurement solution and the extent that e-marketplaces will impact upon direct and indirect procurement. The emergence of Supplier Relationship Management (SRM) and associated systems should also be studied within an Australian context to see if trends from overseas are effecting Australian organisations.

REFERENCES

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