E-Procurement for Increasing Business Process Agility

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ABSTRACT

Today the business is changing rapidly over the period. Every enterprise need to develop new service offerings and new technologies has to be adopted or reconfigured. Most of the service companies are tied with traditional project techniques, which include a staged approach. These stages need to be compressed and changed to meet time-to-market demands. Today every enterprise must be agile enough to respond with changing requirements of their customers. Agility has become the basic key attribute today as business faces uncertain and volatile environments. E-Procurement makes it possible to automate buying and selling over the internet. Typically an e-Procurement-enabled website will have product comparisons across vendors and various processes like tendering, auctioning, vendor management, and catalogue and contract management. High-end e-procurement solutions allow organizations to define their own processes in the form of workflows - thus utilizing concepts of business process modeling. In this paper we present the findings from a recent survey on e-procurement in India and explain how an e-procurement can be used in such fast growing organization to speed up the business activity at the suitable agility level and its impact on centralization and firm’s efficiency in the procurement process.

Categories and Subject Descriptors

K.4.4 [Electronic Commerce]: Electronic data interchange  
(EDI)  
K.4.m Miscellaneous;

General Terms  
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1. INTRODUCTION

In the business buzzword universe, flexibility and agility are often tossed around interchangeably. But the two are vastly different concepts when it comes to business processes and information technology systems. Agility, not flexibility, is key to business's ability to survive and thrive in today's competitive global marketplace.

A company that can quickly accommodate a new customer requiring XML ordering capability, for example, has process-level agility. A company that has many ways to complete a process and encourages their customers to specify their preferences and can deliver that customized experience has transaction-level agility.

For example, customer who specifies they want to place their orders using XML1, wants a bar-code label put on the box, an RFID2 tag on a certain type of pallet, and wants a paper invoice once a month with bulk billing is testing a company's transaction-level agility. Companies with low product diversity but strong competition in the market need to excel at process-level agility. Online bookstores, for example, offer largely the same products, so in order to differentiate themselves they need process-level agility to quickly adapt to whatever improvements become available that will help them ship orders faster/better/cheaper than their rivals. Now, more than ever, it is important for businesses to have agility at the process level because customers require it. And if they don't [have agility], their competitors will take a chance to downgrade. By contrast, companies competing in the electronics industry, where products are highly customized, are well served by building transaction-level agility to capitalize on new processes or technologies that allow them to offer greater levels of customization.

Electronic procurement is defined as the sourcing of goods or services via electronic means, usually through the internet (Schoenherr and Tummala, 2007). Precursors of e-procurement can be seen as early as the 1980s, with the evolution of Material Requirements Planning (MRP3) systems into Manufacturing Resource Planning (MRP II) and then into Enterprise Resource Planning (ERP) systems in the mid-1990s. The practice of

1 XML was designed to transport and store data, with focus on what data is.

2 Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. It's grouped under the broad category of automatic identification technologies.

3 Material Requirements Planning (MRP) enables you to plan material requirements for a manufacturing or procurement process.
Electronic procurement has gained popularity over the last ten years, and so has the research on this emerging area with an identity of its own. The e-procurement process supports the procurement and sourcing activities via Internet technologies and enables an efficient negotiation between buyers and vendors. Loosely describing the processes involved, e-procurement is the purchase and sale of products and services through the Internet using websites, as well as other information and networking systems. Typically, e-procurement web sites allow buyers and sellers facilitate their transactions. Depending on the business model, buyers or sellers may specify costs or invite bids. Transactions can be initiated and completed. E-procurement systems may make it possible to automate some buying and selling and thus cut down on transaction costs. Companies participating expect to be able to control parts inventories more effectively, reduce purchasing agent overhead, and improve manufacturing cycles.

2. EXISTING E-PROCUREMENT METHOD

In the existing method, the purchase manager select the vendors from the available database from their existing ERP software and create the request for quotation (RFQ) for different vendors and print the hardcopy for vendors for dispatching instead of sending e-mail. The current method is having much limitation and it is time consuming. There is a scope of having e-procurement method for replacing the traditional procurement process to dynamic procurement by which the business process can become more agile.

3. PROPOSED METHOD

As a part of reengineering effort aimed at enhancing overall efficiency, there is a need to automate the certain manual process, thereby increasing business process agility and reducing cost. It is necessary to follow the particular type of workflow while implementing procurement process. The technology is a key driver which can be used to check the agility level. Technology is an enabler to business-process agility; it enables us to reconfigure our process capabilities -- either by adding new capabilities to the process, or modifying existing capabilities.

For some companies, the solution is to add additional layers of software to their existing systems as a way to increase business-process agility without having to dump their ERP and start over. One can use Siebel application for increasing customer resource management capability. Ariba's e-Marketplace can be e-procurement option. Using middleware, they can integrate these systems seamlessly into existing ERP solutions which can enable companies to increase their agility.

But every company need an entirely new approach to software to state the demand for agility. The new approach is "on-demand" computing, software solutions that firms can access a la carte via the Internet. Featured in the ubiquitous IBM commercials, on-demand solutions hone in on specific capabilities that businesses need to build value and respond rapidly to change.

The propose model is:

An architecture of web-enabled e-procurement system

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4 International Business Machines (IBM) (NYSE: IBM) is an American multinational computer, technology and IT consulting corporation headquartered in Armonk, New York, United States.
1. E-Procurement Agent: The e-Procurement agent is a software component implemented in Web services. It serves as a middle-tier component to handle the interactions with the Web Services Registry and with the trading partners’ Web services.

2. The User Interface (UI) Subsystem: Since the e-Procurement agent is implemented in Web services, the e-Procurement UI subsystem can be easily implemented using various user interface components that are capable of consuming Web services including:
   a. A GUI client running on desktop computers. GUI-based applications provide rich user interface elements and interactions. It is often used by purchasing personnel working from their desktop inside a company.
   b. A browser-based application. Web presentation layer components are web programs running on the server-side. These Web presentation layer programs can consume Web services and provide easy access to the e-Procurement system wherever there is Internet access.
   c. Mobile clients. Mobile device such as cell phones, personal digital assistants (PDAs) can consume Web services. Special micro-browsers can be used to get access a server-side Web program. The mobile web programs need to render Web pages in formats such as WML or cHTML that are appropriate for the requesting mobile devices.

3. Supplier Web Service Registry Subsystem: The public UDDI is too generic to be useful for the proposed e-Procurement System. It does not provide adequate information from an e-Procurement viewpoint. The Registry subsystem plays a key role in enabling the dynamic nature of the procurement process as it expands the list of potential suppliers, an important feature especially for the expedited purchases which the standard suppliers may not be able to fill. E-Procurement agent uses a set of Web operations published by the Registry Subsystem to access information of suppliers’ Web services.

4. Registry Management Subsystem: Strategic sourcing personnel uses this subsystem to maintain the supplier data and their Web services entries. Potential suppliers are evaluated to determine whether these suppliers should be registered in the private Web Services Registry. New suppliers and their Web services entries can be continuously identified and updated by accessing the public Universal Directory, Discovery, and Integration (UDDI1) Business Registries or directories of other public exchanges (UDDI.com, 2003).

5. Web Services by Suppliers: In our current design, suppliers who want to join the e-Procurement system need to implement Web services required by the e-Procurement system according a set of Web operations based specific defined by a published WSDL file. Having these Web services available enables the supplier to “assess and submit quotes” in real time such that little or no human intervention is required to respond to a customer request.

**Effective Implementation**

1. Start with non-critical items. An initial e-procurement system should slim the amount of paperwork needed for purchasing and reduce order complexity by standardizing the exchange process between supplier and buyer. Use your intranet to bring all internal stakeholders on board with your new procurement process and to establish internal customer behavior. Streamline, map, test, troubleshoot and improve the process before expanding it to external suppliers. Work with a favored supplier to test the system.

2. Leverage your system once it’s running. Exploit your full purchasing power by using reversed auctions. Invite new suppliers to participate once the system has proven itself.

3. Aggregate buyers within your organization to increase your purchasing power and gain better pricing.

4. Use a portfolio approach to expand your system. It is not possible to have uniform relationships with all suppliers nor are all purchasing requirements the same. Sort purchasing needs into groups that can use a similar process and a similar template.

**4. RESULTS & DISCUSSION**

E-procurement systems provide both operational and strategic benefits. The operational benefits are related to improving the efficiency of the procurement process and thereby reducing the total costs of procurement and centralization.

The data for this study were obtained from the purchase manager or the most senior manager involved in procurement for a business unit within a firm.

The following graph shows the impact of e-procurement on centralization.

![Graph showing impact of e-procurement on centralization](image3.png)

**Figure 3. Impact of e-procurement on centralization.**

**Saving time:**

Also, e-procurement saves time. Buyers do not need to leave their desks or make phone calls to suppliers in order to place orders; they simply go through the Internet. And, because suppliers receive the order almost immediately, they can also fulfill and ship it much faster than with the traditional procurement methods.

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5 personal digital assistant, a handheld device that combines computing, telephone/fax, Internet and networking features.

6 compact HTML, a subset of HTML for small information devices, such as smart phones and PDAs. cHTML is essentially a pared down version of regular HTML over the Internet.

7 Universal Description, Discovery and Integration (UDDI) is a directory service where businesses can register and search for Web services.
Benefits of Adoption

The main benefit of adopting an e-procurement system is the ability to consolidate multiple information systems in a single place, while establishing a standardized way to conduct purchases and interface with suppliers. XML-based Web services have streamlined this process, making adaptation cheaper than it was a few years ago. Those who make the switch to e-procurement often find that they smooth out relationship glitches with preferred suppliers, often establishing a relationship which if better long-term pricing. E-procurement establishes pricing controls and buying controls, often meeting goals set by Chief Financial Officers for establishing who can authorize purchases and spend money.

Future of E-Procurement Adoption

The growth trend should resume sometime in 2006. The first area that is likely to see an increase in spending is online auction and reverse auction systems followed closely by applications that tie these auction systems into SRM and inventory systems. One surprise is that the much-touted public online marketplaces of the late 1990s failed to catch on, other than a few exceptions such as eBay and comparison systems like Shopping.com. Most companies preferred to install their own private systems allowing them to interface with approved suppliers.

5. CONCLUSION

E-Procurement has been in existence for a substantial period. To achieve cost and time efficiency, several enterprises and governments now consider it a crucial cog in the wheel of their procurement processes. With recessionary winds blowing across the globe and a growing need to rationalize spends while sustaining optimum levels of productivity, enterprises big and small will further leverage the e-Procurement model to achieve greater savings and deliver enhanced value. Advances in Internet and media technologies, now require a revisit of the traditional methods of e-Procurement. As the current market conditions tighten, e-Procurement facilitator companies need to reinvent themselves and devise newer methods, so as to achieve far greater reach with greater process simplicity and usability. Additionally, we summarize research addressing benefits gained from earlier information technologies, and we see that a broad set of benefits are likely to be realized in the supply chain because of the enhancements afforded by Web services. Certainly, empirical research is needed to better understand these benefits, along with research that addresses the barriers to implementation and the development of business processes that take specific advantage of Web services unique characteristics.

This paper proposes an alternative design and implementation complementing current UDDI registry functions. It may accelerate the development of industry specific vertical Web services registries to support industry specific vertical marketplaces. The use of advanced technologies such as Data Envelopment Analysis and best practices such as Total Cost of Ownership for selecting suppliers and possibly for allocating purchase quantities become more viable as Web services provide additional data and processing capabilities. Also, the impact of Web services on specific attributes of supply chain performance needs to be further investigated as well.

6. REFERENCES

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