

EPROCUREMENT AT THE UNIVERSITY OF TORONTO: PRODUCTIVITY SAVINGS AND THE SME CHALLENGE

Eddy Jin*

ABSTRACT. Our eProcurement system was implemented as a means of providing an efficient tool to purchase low dollar items. The results were outstanding as eprocurement reduced procurement to pay cycle from 3.46 hours to 20 minutes. However, because of the unique purchasing requirements of research, our supplier base is disproportionately high in small and medium sized enterprises (SMEs). Furthermore, most SMEs don't have the technical expertise to implement an eprocurement solution so they require external resources. These resources are often costly relative to their margins so there is little incentive to adopt eProcurement. Given this challenge, we developed a service (charging suppliers cost recovery rates) to enable SME's onto our eMarketplace

INTRODUCTION

Background

In 1995, the University of Toronto implemented an enterprise resourcing planning (ERP) solution to replace its old financial system. Unfortunate at the time was the naivety in believing the new system (SAP R/3) would simplify the financial procedures for its more than 12,000 faculty and staff. What took hold immediately was overwhelming frustration from users over the challenge in navigating the sophisticated functions of the ERP system. In particular, the purchasing functions were both cumbersome and non-intuitive. The net result was that departments frustrated with this new solution adopted 'shadow' systems of their own and/or abandoned the new financial system when it involved making procurement transactions. In short, users opted to bypass the system through creative workarounds such as inputting a single monthly transaction for all procurements.

** Eddy Jin, BS in Zoology, and is the Director of Procurement Services at the University of Toronto, Canada. He has been promoting strategic procurement transformation for the past 13 years using innovative business approaches, the development of eprocurement tools and the implementation of leading-edge legal formats.*

This created a multitude of drawbacks. At the departmental level there was a significant loss of productivity as resources were diverted from value added work to time spent on building and managing backup databases to capture their transactions. Centrally, the University was losing spend information and therefore forfeiting any leverages in supplier negotiations; resulting in sub-optimal pricing and ownership costs.

To respond to the University community's frustration, we decided to investigate the implementation of an eprocurement solution. The strategic benefits of an eprocurement initiative has been well documented: Improved efficiencies through elimination of manual paper based processes; elimination of maverick buying; collection of detailed spend data; supply chain simplification and empowerment of front line staff (Neef 2001).

Although these benefits were clearly some of the objectives in our initial planning, our focus for an eprocurement solution however, was to meet two essential requirements: 1) Ease of use; and 2) financial integration into our ERP system.

The consulting firm KPMG (KPMG Consulting LP) was retained to conduct a review of eProcurement solutions to meet our requirements. Through the plethora of options recommended, implementation began in 2001 with a solution that provided the highest degree of ERP integration when the SAP Enterprise Buyer Professional™ system was chosen. The system was piloted originally in 2002 with 3 vendors and full rollout to various departments beginning in 2004.

It is important to note that the eProcurement program at the University of Toronto has both xml purchase order delivery to a supplier and xml invoice delivery from supplier to our ERP system i.e. a truly paperless sourcing to pay solution.

Supplier Enablement

A key challenge encountered in the rollout was supplier enablement and the ability to provide an eMarketplace with a substantive selection of products for our research intensive institution. The Canadian business landscape is heavily skewed towards small medium sized businesses (SME) and this has been

highlighted as a unique challenge by the Canadian e-Business Initiative report on SME e-economy engagement (Canadian e-Business Initiative 2004). Whereas larger suppliers had internal IT resources to engage in a Business-to-Business (b2b) relationship, SME's needed to outsource those skills. What became a surprising obstacle to SME b2b enablement was the dearth of b2b service providers.

In this article, we discuss the business case that was developed at the University of Toronto to initiate and grow our eProcurement program and to describe our initial solution to facilitate the enablement of SME suppliers onto our eMarketplace.

METHODS

Business Case for Full Rollout

An activity based costing approach was used to develop the metrics to rationalize the full rollout of the eProcurement program. From the initial business requirements gathering stage of the pilot implementation, full documentation of procurement processes was captured. An online survey was then constructed to collect purchasing activity data from all user roles across the University.

eProcurement Activity Measurements

A researcher and business officer were timed while they completed individual purchasing events.

User Feedback Survey

An online survey was created in 2007 to solicit feedback from all eProcurement users.

Activity-Based Calculations

An hourly rate of \$37.33 was used to calculate potential economic benefits.

RESULTS

Procurement process flows. The initial requirements gathering stage in the implementation of the eProcurement system resulted in the identification of 29 steps in the source to pay cycle of 7 stages of activities (Table 1.) The entire source to pay cycle was reduced to 7 steps in the eProcurement system (Table 1.)

Table 1
Stages and steps in source to pay cycle in manual process and in eProcurement system

Stage	Steps	
	Manual	eProcurement
Sourcing		1. Log in system
	1. Browse catalogues	2. Browse catalogues
	2. Note order details	
		3. Create Shopping Cart
	3. Get approvals	
Ordering	4. Forward for processing	
	5. Phone in order	
	6. Approve others' orders	4. Approve others' orders
	7. Key requisition	
	8. Key Purchase Order	
	9. Print PO	
Supplier Activity	10. Fax PO	
	11. Set-up accounts	
	12. Negotiate terms	
Product Receipt	13. Handle pricing disputes	
	14. Receive Goods	5. Receive Goods
	15. Resolve order errors	
	16. File packing slips	6. File packing slips
Invoice Activity	17. Handle product returns	
	18. Approve invoices	
	19. Match paperwork	
	20. Key invoices	
	21. Investigate pricing errors	
ERP/Administration	22. Adjust PO	
	23. Maintain shadow system	
	24. Reconcile ERP/shadow system	7. Reconcile ERP
	25. Reconcile p-Card	
	26. Transfer funds re: NSF	
Filing	27. Split purchases between accounts	
	28. Compile audit documentation	
	29. File receipts / packing slips	

Activity or Effort Required

There were 394 responses to the survey. The results of the data collected show that it takes 3.46 (+0.93, n=394) to source, order, engage supplier, receive product, process the invoice, update ERP/records and file documents for any purchase made through a manual process (Figure 1.) When we measured the effort to purchase an item through the eProcurement system, it took only 0.33 hours (n=2) (Figure 1.)

Procurement Costs

Using an hourly rate of \$37.33, it 'costs' approximately \$129 (i.e. \$37.33 x 3.46) to purchase an item at the University through a manual (paper) process. If the same item is purchased through the eProcurement system, it would 'cost' \$12 (i.e. \$37.33 x 0.33). This results in a \$117 economic savings for every transaction made on the eProcurement system.

Each procurement stage required varying amounts of effort or time to complete (Figure 1.) both in a manual process and through eProcurement.



Figure 1. Activity (in hours) for the purchase of an item: a) manually (in red) and b) through the eProcurement system (in blue).

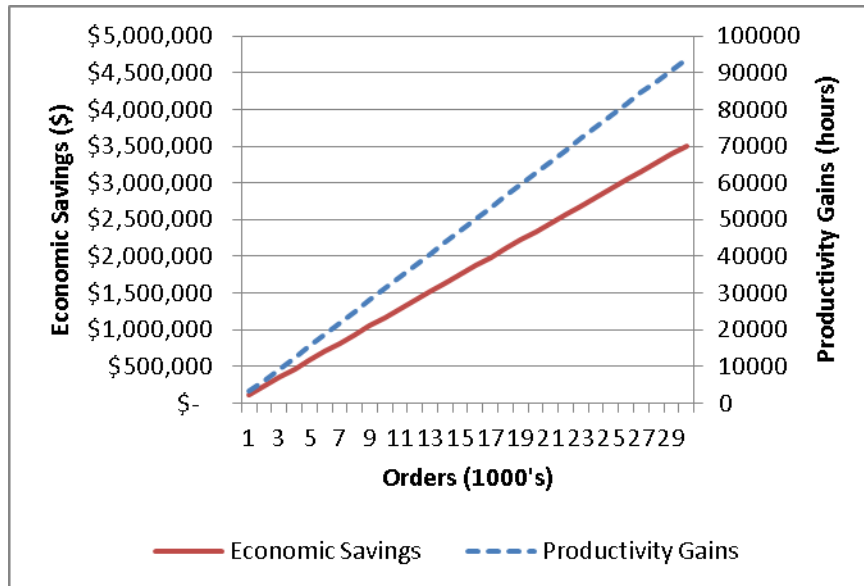


Figure 2. Activity based calculations of Economic and Productivity Savings

Productivity Gains

Productivity gains were determined as the time saved between using eProcurement rather than a manual process to purchase an item. Results in Figure 1 show that the productivity gain is 3.13 hours (i.e. 3.46-0.33 hours) per transaction. Potential productivity gains are determined by multiplying productivity gain by number of purchasing transactions (Figure 2.)

Economic Gains

The productivity gain multiplied by the average hourly wage at the University is the calculated economic gain. For each purchase made through the eprocurement system, the University receives an economic gain of 3.13 x \$37.33, or approximately \$117, compared against a purchase done manually. Projected economic gains over increasing orders through eProcurement are shown in Figure 2.

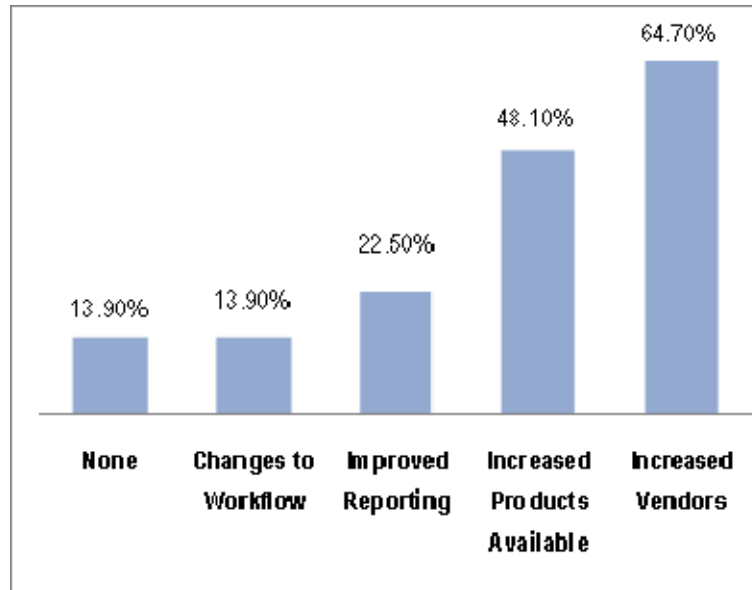


Figure 3. 2007 eProcurement user survey results. There were 216 responses.

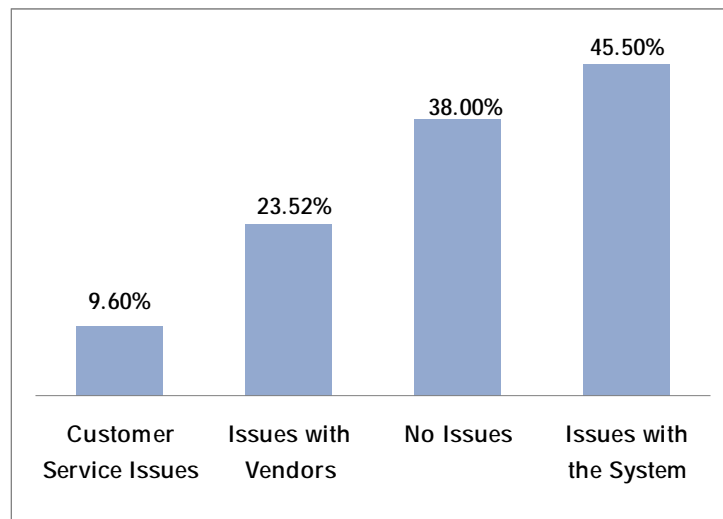


Figure 4. 2007 eProcurement user survey results. There were 216 responses.

User Feedback

There were 216 responses to the online survey in 2007. The key areas of need from the survey indicated users wanted: 1) more suppliers (resulting in more products); 2) fixing 'bugs' in the eprocurement system; 3) better management of suppliers; 4) better reporting (Figures 3 & 4.)

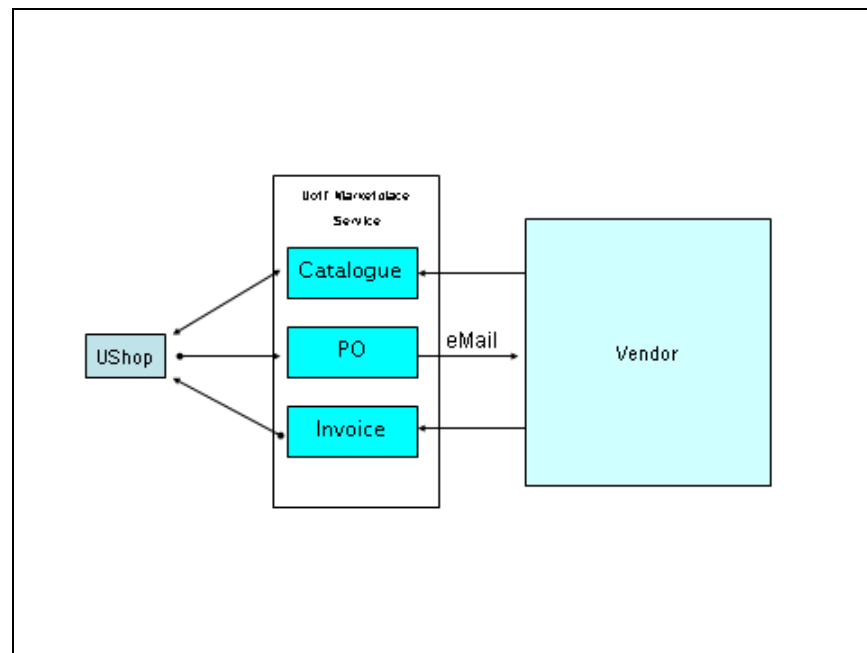


Figure 5. Marketplace service model. UShop is the eProcurement system.

Marketplace Service

In response to user feedback (Figures 3 & 4) on their need for more suppliers and products we had to develop a service to help small medium enterprise businesses engage in a b2b relationship. The service provider market was relatively small in 2007 in the ability to build a paperless b2b service. Although there many providers who could create online catalogues and portals for order integration, few could offer electronic invoicing services. The service we developed

had 3 components: 1) a self-serve online catalogue that was integrated into our eProcurement system; 2) ability to send the supplier by email, xml formatted purchase orders; 3) ability for a supplier to log into the University's eprocurement system to post an invoice against a purchase order (Figure 5.)

DISCUSSION

Productivity savings

The University has realized significant productivity and economic savings since the implementation of the eProcurement savings. The 3.13 hour difference between a manual and eProcurement purchase transaction has provided real tangible benefits to the University. For example, a significant effort is spent on invoice payment and reconciliation (Figure 1). In fact, the invoicing stages of a typical manual procurement take 1.76 hours (stages, Invoice Activity, ERP/Admin and Filing in Figure 1.) Imagine a department suddenly eliminating invoices from an eProcurement vendor because now they are electronically received and paid. Many departments have been able to reallocate the resources typically spent managing invoicing to value added tasks such as direct support on teaching or research tasks. Currently (2012) the University has made over 100,000 purchases through the eProcurement system. This has generated over 313,000 hours of productivity gains. Assuming an annual work rate of 1863 hours/employee, the University has saved the work of an equivalent of 168 staff. That's equivalent to \$11.7 million in economic gains. Although it was not an objective of the eProcurement program, some departments have begun to strategically reorganize resources with eProcurement as the tool. One department has been able to correlate their success in research funding to the reallocation of a resource towards grant application support as a result of the elimination of significant invoice payment efforts.

Financial Savings

There are two kinds of hard dollar savings delivered from our eProcurement system: 1) contracted buying savings; 2) cost avoidance savings.

All suppliers enabled on the eprocurement system are under contract so pricing and other value add features are built in for the user. As many studies have shown, eProcurement facilitates contract compliance where spend savings often exist (Parida et al. 2006).

Another source of financial benefits from our eProcurement program came from incentives provided by the suppliers. With a paperless end-to-end program, the suppliers benefit from efficiencies derived from touch less order entry and especially, e-invoicing. E-invoicing significantly reduces receivable costs for suppliers and can be as little as 40% of paper based invoicing costs (Gattiker, 2007). With these types of benefits for suppliers, there is great incentive to convert manual purchases (e.g. phone, email) from a customer onto the eProcurement channel. One creative solution a supplier provides University users are free shipping on eProcurement orders, only. This is a significant cost avoidance incentive as many of this supplier's products require special handling. One department in particular has been able to avoid over \$130,000 in shipping costs over a 5 year period.

Challenges

Although there are significant benefits from eProcurement, the management of challenges that are inherent in building and maintaining any technology based solution is not trivial.

As our users have noted in a previous survey, maintaining a user friendly, stable tool is essential. This means that the system has to evolve as business processes evolve. One example is the requirement to split purchases across multiple accounts. When the eProcurement system was initially configured in 2002, the number of shared research grants was not very significant. Ten years later, co-authored research grants are the norm so the eProcurement system must be able to meet the new requirements.

Supplier Enablement

Another challenge has been to maintain and grow our product selection through both catalogue enhancement and increased supplier enablement. This is a significant challenge in the research intensive environment because of specialized procurement needs. Many research related products are unique with not only limited number of suppliers but also in the size of the organizations. Canada is known for its high ratio of SME suppliers (Canadian eBusiness Initiative, 2004) and this is exasperated in the narrow markets for research products. These specialized SME's often do not have IT resources and to compound their challenges, they are often reluctant to even consider eProcurement (Canadian eBusiness Initiative,

2004). Another obstacle for SME suppliers to become eProcurement enabled is the dearth of cost effective service providers. Although there are many services for online catalogue hosting, the development of xml documents and the Internet structure to deliver and receive them often makes the viability of eProcurement beyond their financial reach.

Against this backdrop of conflicting demands from our users for more suppliers and products for the eMarketplace; and SME suppliers struggling to not only fund but find adequate resources to build b2b solutions, we developed a cost recovery service.

eMarketplace Service

This service has been made available to SME suppliers since 2007. We provide a supplier with an online (punch-out) catalogue that is self-serve i.e. they can upload and edit their products. The service also provides a PO delivery via email of an xml document. We created a customized role in our eProcurement system to allow suppliers to submit invoices directly (aka. "po-flip"). The full paperless service was essential as most of our productivity gains are through the elimination of paper in the procurement cycle.

Current Status of eProcurement

There is continued uptake of our eprocurement system as the user base has reach over 2500 users. This correlates well with our purchasing card user base and is reflective of the number of staff who has buying responsibilities. What is disappointing however is the actual use of eprocurement as the tool of choice in making purchases. Of the 17 suppliers in our eprocurement program, only 25% of those suppliers' spend is going through this channel. In other words, staff are using alternative purchasing methods to purchase from eprocurement enabled suppliers. The end result is that significant efficiencies are not being utilized and this impacts not only the university but the suppliers as well. For each transaction not going through eprocurement, we forego a \$117 economic benefit; in addition to the financial losses incurred by not utilizing supplier incentives.

Future

As the need to grow our eMarketplace continues, many new models are now available that consider the challenges of supplier enablement and management. Cloud services; buyer pay

eMarketplaces; and 3rd party supplier management services will allow the University to evolve its eProcurement program with options beyond our existing hosted model. We anticipate these alternative services will help us eliminate the need to run b2b services; especially for our SME suppliers.

Lessons Learned

- Choice is a requirement. Users require a one stop shop so if your emarketplace does not have enough products or suppliers, the tendency is to use the most common method to purchase all their goods and services. Often that choice is a phone call to the supplier.
- Build it and they will not come. Even if you have an efficient, easy to use system, it is not enough for users to voluntarily use it. This is a significant challenge when you cannot mandate the use of a system. Asking users what their needs are can produce only a limited understanding. There's a saying attributed to Henry Ford the auto industrialist that when asked what he thought his customers wanted he replied, "my customers would tell me they want a faster horse".
- "Deep" User understanding is a key requirement. You cannot understand what a user needs by asking them questions from a professional purchaser's perspective.
- Vendors need eprocurement training, too. First, sales incentive model must support eprocurement within the vendor's business structure. For example, our most successful vendors tie sales commissions with conversions of sales to the eprocurement channel. This is important because sales representatives are often incented for new sales; not for converted existing sales. Secondly, eprocurement must be translated throughout the vendors' internal operations. Often, accounts receivable may send paper invoices, unaware there is an electronic invoicing process with the buying organization. This causes confusion (often resulting in duplicate payments) and leads to frustration by a buyer.

In conclusion, a new awareness is currently being undertaken to refocus our entire approach to delivery of our eProcurement program. Through the use of user centric analysis, there is the understanding that users aren't looking for a fancy technological solution; they really

need a holistic set of procurement solutions. This is very similar to the Apple Inc. model where they don't just develop the latest technology; they create well designed solutions that worked together, as part of the individual's own ecosystem (e.g. iTunes).

Since 2011, we have engaged Business Designers to tackle the issue of why our community is not utilizing the eprocurement tool in place. Their approach has been to understand what users really need by analyzing the stories they tell about their daily working environment. In the end, we have learned that our users need more than an elegant eprocurement tool; they need a complete "procurement" solution that includes eprocurement. We are currently rebuilding our procurement function to provide an extensive set of improvements in our support tools. These include community social media channels ("connect me with other users who may have similar procurement issues"); inventory of reusable items ("isn't there a lab with an older model I could use?"); and a greater level of customer support ("I want someone to pick up the phone").

Finally, we have also refined our vendor engagement model that incorporates a win-win approach to our business relationships. eProcurement must be a sustainable model for the vendor. If the costs of eProcurement far outweigh the benefits, it will be just another costly expense that in the longer term, results in costs being transferred back to the buyer!

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