



CASE STUDIES OF E-PROCUREMENT INITIATIVES

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Printed in the United States of America.

EXECUTIVE SUMMARY

The following report describes how four companies in the construction industry have implemented e-procurement initiatives. All of the descriptions of the cases are structured using a common framework of Planning, Implementation, and Evaluation (PIE Framework). Regardless of the type of e-procurement solution implemented, the researchers discovered that there were many key success factors common to all companies in each phase of the of PIE framework. Chapter 1 highlights these critical success factors. The remaining chapters focus on the case studies of four construction industry participants. Specifically, three types of e-procurement models are examined in the case study write-ups: an e-procurement tool for maintenance, repair, and operation (MRO) items, a reverse auctions e-procurement tool, and a tool to process requests for information (RFIs). A fourth case study examines one company's experience with the adoption of multiple e-procurement initiatives including: third-party marketplaces, MRO buying tools, homegrown systems, and backend ERP systems.

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ACKNOWLEDGMENTS

The content presented herein was developed under the guidance of the Construction Industry Institute's Project Team 180. Without the information, insights, and feedback shared by Mr. Patrick J. Bailey, Ms. Rosemary Bell, Mr. Joseph Brennan, Capt. Ron Clark, Ms. Li Doyle, Mr. Winfried Ender, Mr. Joseph L. Hilgar, Ms. Judy Mason, Mr. Bill McCauley, Ms. Jean McGinn, Mr. Mark Palmer, and Ms. Ruth Wepfer, the research would not have been possible. Special thanks are extended to Mr. John Voeller, chairman of PT-180, for his dedication to the project.

The writers wish to sincerely thank the Construction Industry Institute for financial support of the research described herein. One of the graduate research assistants in this project was also funded through a National Science Foundation Graduate Research Traineeship grant. In addition, the Consortium for Global E-Commerce at the University of Wisconsin-Madison provided support for this CII project in a number ways. It provided matching funds for the CII grant to support one research assistant for the duration of the project. The CGEC also covered the expenses of the web meetings of the research team. This CII project also leveraged the findings from related CGEC workgroups and projects with industry on e-collaboration and e-procurement.

The writers offer special thanks to the numerous individuals that provided support throughout the process of developing the case studies. From the inception of the cases, to the final review, their guidance and continuous support was greatly appreciated by the entire CII PT-180.

CHAPTER 1: THE PIE FRAMEWORK

1.1 Introduction

All of the case studies are written in a common framework. This format was chosen because it is an easy way to illustrate the complexities of implementing an e-commerce initiative. Much like successful projects in the construction industry, the researchers found successful e-commerce initiatives also follow a series of **P**lanning, **I**mplementation, and **E**valuation (PIE) stages.

1.1.1 Elements of the Planning, Implementation, and Evaluation Stages

The planning stage focuses on the tasks companies must engage in prior to the purchasing or installing the necessary infrastructure to carry out the e-commerce initiative.

The Implementation stage addresses the tasks that are required to successfully implement an e-commerce solution. It assumes that the decision to implement an e-commerce solution has already been made during the planning stage. A decision has also been made whether or not the system will be homegrown or one that is purchased from a vendor.

The Evaluation stage evaluates whether or not the e-commerce initiative that has been implemented has met the intended goals set forth in the planning stages. It describes some of the important lessons that were learned, some unexpected, during the planning and implementation stages.

Each stage of the PIE Framework can be further broken down into four distinct areas (see Table 1.1). These areas are issues related to: people, processes, technology, and management. This level of detail is provided so one can see how successful companies have approached each stage of the PIE Framework.

Table 1.1: The PIE Framework – Planning, Implementation and Evaluation

	Elements of Planning	Elements of Implementation	Elements of Evaluation
People Issues	Identifying Stakeholders	- Training and Change Management - Assisting Suppliers	- Benefits of Increased Collaboration - Underlying fear from a supplier's point of view
Process Issues	- Process Mapping - Determining Extent of Integration	Establishing Metrics	- Return on Investment - Time Savings - Increased Data Collection
Technology Issues	- Software Tool Selection - Software Vendor Selection - Compatibility of technology and infrastructure with suppliers - Scalability of the new Initiative	- Initial Redundancy - Pilot Projects - Standardization - Connectivity, Integration, and Infrastructure Issues - Securing Information	Using Key Metrics: Continue or Terminate?
Management Issues	- Development of a Core Team - State of Industry/External Evaluation - Problem Identification - Identifying Needs and Wants of Company and the new Initiative	- Role of Core Team During Implementation - Management Buy-in & Support - Accountability and Core Team During Implementation - Aligning initiative with Corporate Culture	- Willingness to be on the Cutting Edge - Management Buy-in: All Levels

1.2 Elements of Planning

Planning represented a critical first step for all the companies. The companies interviewed for the case studies indicated that the attention to detail at the planning phase is what separated them from other companies on their peer group who were not as successful in implementing e-commerce solutions.

1.2.1 Development of a Multi-Disciplinary Core Team

A Multi-Disciplinary core team consists of representatives from various areas and technical disciplines of the company. It is important that the core team represent all groups that will be using/supporting the e-procurement initiative so that the requirements of the initiative are well defined and the benefits understood. In the planning stage, members of the core team are used to define what is needed and make sure individual processes are aligned with the capabilities of the initiative. During the implementation and evaluation stages, the core team takes ownership of, and accountability for the initiative. In addition, the team is responsible for training the other employees in the company.

Applicable Cases: Case Study 1, 2, 3

1.2.2 Problem Identification

Problem identification entails identifying the needs and wants of the company as they relate to the new initiative. All the companies indicated that a very thorough discussion took place to determine why exactly the e-procurement initiative was being pursued. In some instances, a matrix was set up listing the needs and wants of the new tool. Once the company established a clear list of goals for the initiative, vendors were interviewed to determine if they could provide a product to fill the needs and wants of the company.

In all cases, there were many software packages available in the marketplace that could address the company's needs. The software packages offer different levels of functionality, so understanding the needs of the company, the work processes involved, and the technical attributes of the systems and the end users implementing the initiatives is critical. Some of the

needs that were identified in the cases are:

- Ability to communicate with back-end/partnering systems
- Cost and ROI time-period
- Level of automation or improvement to current processes
- Homegrown, off the shelf, or Application Service Provider
- Option of expanding/purchasing new modules in the future
- Presence in the marketplace, acceptance by industry

Applicable Cases: Case Study 1, 2, 3

1.2.3 Scalability of the New Initiative

Companies must determine how far reaching they want their new initiative to be. Companies operating on a global basis will have to overcome different obstacles than those operating on a local or regional basis. Companies must carefully consider the impacts the new initiative will have in the areas of: infrastructure, training, systems integration, human resources, etc. Companies must also determine if a vendor's solution can adapt as the company grows.

Applicable Cases: Case Study 1, 2

1.2.4 Determining Extent of Integration

Companies must determine how integrated they want the new initiative to be with their legacy systems. Integrating a new system into an existing one poses many challenges in the near and long term. Most of the companies interviewed indicated their choice of level of integration was determined by how functional their current IT system was presently and functional it will remain in the future. For instance, companies opted for more of a “stand-alone” solution if they were planning to implement a new ERP system such as SAP.

Another critical decision that the case study companies had to make was whether or not to keep the IT infrastructure in-house or outsource it to a vendor. The decision criterion here is to determine if it is a better economic decision to outsource the operation of the infrastructure or

develop an internal IT department to establish and maintain all necessary infrastructure required to operate the initiative.

Applicable Cases: Case Study 1

1.2.5 Compatibility of Technology and Infrastructure With Suppliers

In B2B e-commerce initiatives interaction with external parties is required. This necessitates that the technological infrastructure of the external parties be compatible with that of the company. It is critical to establish a baseline understanding of how the company's infrastructure is compatible with the infrastructure of their suppliers. Knowing where the systems are compatible and where they are not compatible will assist in the development of implementation plans for the initiative.

Applicable Cases: Case Study 1, 2

1.2.6 Software Vendor Selection Criteria

The rise and fall of many internet-based companies has made the survivability of the vendor company an important consideration in the vendor selection process. It is important to analyze characteristics of potential software vendors to gauge future concerns with the vendor in terms of product expandability and upgrades, software support, ownership of the software and data. Areas to consider when evaluating the software vendor:

- The vendor's presence in the industry as well as other related industries
- Financial aspects of the company including positive cash flow, private or public ownership structure, and major investors.
- The software vendor's vision and direction
- Industry leaders may have equity stakes in companies. This can be a good indicator of the potential acceptance and use of the vendor's solutions.
- The vendor's specific experience in the construction industry

Applicable Cases: Case Study 1,2,3,4

1.2.7 Process Mapping

Depending on the extent and complexity of the process/problem being addressed, creating a process map of both the current and future process is an essential early step.

Without an understanding of how current processes work, or having only a rough idea of the entire process, it is difficult to assess the choice of solutions and the potential savings realized with an e-commerce initiative. Process maps help define the responsibilities, information flow, etc, of the current and future process. This provides a basis for decisions on how e-procurement solutions should work and perform.

Applicable Cases: Case Study 1, 3, 4

1.2.8 Identifying Stakeholders

For the purpose of this report, stakeholders are individuals that exist in the current process that will have newly defined roles or responsibilities as a result of implementing the new e-procurement initiative. It is important to understand who these people are so that resources, training, education can be allocated accordingly. Without the proper identification of the stakeholders, the execution of any proposed process/tool changes will be flawed.

Applicable Cases: Case Study 1, 2, 3

1.2.9 State of Industry/External Evaluation

A high-level, strategic issue when planning the use of an e-commerce tool is to evaluate the industry as a whole including: e-commerce initiatives and tools being used, and how these solutions are changing the business processes in the industry. The evaluation may include suppliers, customers, industry leaders, and competitors. Evaluation topics include:

- Types of models being used
- Standardized work processes or standardized data captured by the models
- Means by which Return on Investment is being assessed
- Consortiums revolving around one type of tool or data standard
- Impact of new models on business alliances and relationships

Influence of industry leaders and customer trends should be considered when evaluating tools.

Applicable Cases: Case Study 1, 2, 4

1.3 Elements of Implementation

Implementation of the various e-commerce solutions was often a very complex process. Issues that had to be dealt with ranged from obtaining upper management buy-in to the e-commerce solution to getting suppliers acclimated to using the new solution.

1.3.1 Upper Management Buy-In & Support

Management support is viewed to be critical to the success of any new initiative. For many of the companies interviewed, a change in culture was required for full acceptance of the initiative. The quickest way to implement the new e-commerce initiatives was for upper management to insist on their use and actively track their adoption throughout the company. Upper management buy in was critical in order to secure final approval and financing of all of the case study initiatives.

Applicable Cases: Case Study 1, 2, 3

1.3.2 Training and Change Management

Every major change in software, processes, etc. requires training and dealing with issues of change management. For the purpose of this case, change management is defined as the process of changing the roles, responsibilities, habits, perceptions, etc. of the people directly or indirectly involved in the modified/new process. Training can be broken down into two methods: push or pull. The pull method incorporates the use of instruction booklets, information pamphlets, etc. sent out to all who will be using the new initiative. In the pull style of training it is hoped that employees will read the information pamphlets, understand it and immediately use the new e-commerce solution. In a push style of training, interactive training sessions and classes are scheduled to train the users on the use of the new initiative. Most companies started their training with a version of the pull method of training but soon found the new initiatives were not as intuitive as initially anticipated. The case study companies had to adapt their training to

include push style training. Although the push style training is more costly than the pull style, in the end it is more efficient because the initiative gets accepted more quickly. In addition, employees perceive a push style training as a signal of commitment from management that they want the initiative to succeed.

Applicable Cases: Case Study 1, 3

1.3.3 Aligning the E-Commerce Initiative with Corporate Culture

In the clearest example of aligning e-commerce initiatives with corporate strategy, one company realized they had to change the entire culture of their employees. The company's original purchasing strategy was initially formulated in the days of employee empowerment. The resulting culture created a situation where there were many maverick purchases that ended up costing the firm money. When rolling out the new e-commerce initiative, the company went to a more centralized structure with the employees having less autonomy in their purchasing decisions. This switch in culture created a significant amount of backlash within the corporation. In the end, the company ended up having to adapt their training programs to address the acceptance problems. All companies did not have such an extreme case of having to change their corporate culture. However, all companies had to address their internal culture in some way in order to insure the successful adaptation of their e-commerce initiatives.

Applicable Cases: Case Study 1, 2

1.3.4 Accountability of Core Team During Implementation

Assigning accountability of the e-commerce initiative and its processes is one of the early steps in the implementation phase. It is critical to understand what groups are responsible for training, recording/reporting, and implementing new initiative.

An important role of the core team is to serve as the group accountable for the development of the new processes and the training of stakeholders during implementation. The core team provides training and general education, answers questions, troubleshoots/modifies problem areas, establishes and monitors metrics, and reports progress to upper management.

If the initiative's accountability is immediately assigned to a particular functional group within the company (IT, procurement, etc), communication and problem solving becomes skewed by the expertise of that particular department. Furthermore, if a particular department becomes solely responsible for the tool, the success or failure is improperly placed on an individual group instead of the multiple departments, businesses, and stakeholders. By maintaining a multi-disciplined core team, a proper voice and accountability is assigned to representatives from all parties.

Applicable Cases: Case Study 1, 3, 4

1.3.5 Assisting Suppliers

All companies in the case studies were faced with some of their suppliers not having the technological capability to connect with the new e-commerce initiative. All companies were willing to assist their suppliers. The assistance ranged from providing information regarding what was expected of the suppliers to bringing the suppliers into the company and offering training. The training varied from informational sessions with the company's IT department to sessions with the vendors supplying the e-commerce tool. In these sessions, the company or the vendor would describe what type of technological infrastructure was necessary and any necessary technical specifications that were required to execute a transaction with the new tool. Despite the best efforts of many of the companies, there were times when relationships with certain suppliers had to be discontinued because of a supplier's inability or unwillingness to adapt to the changing transaction environment.

Applicable Cases: Case Study 1, 2

1.3.6 Establishing Metrics

Establishing and interpreting proper measurements of any project is critical for understanding the extent of its success. Many e-commerce projects are unique in that the metrics that are/can be established by the initiative could not have been measured by traditional systems. Companies have found that the best approach to establishing metrics is to first brainstorm and make a list of

several quantitative and qualitative measurements. Then, a group of these measurements is chosen and tracked. Examples of metrics include:

- Reduction in cycle time or project lifecycles
- Reduced cost of procuring materials, MRO goods, office supplies, etc
- Improved worker productivity

These metrics should not be considered as the only measurements as the project progresses. Many companies found that important measures of success often were not seen or considered in the early phases of the project. Furthermore, companies noted that in repeated use of e-commerce solutions in project settings often provided different measurements of success depending on the complexity of the project being analyzed. As these tools and processes become refined, a set of standard measurements may be available for users of the tool. However, the relatively new introduction of many e-commerce tools requires companies to continue brainstorming and remain open to the metrics used for the measurement of success or failure.

Applicable Cases: Case Study 1, 2, 3, 4

1.3.7 Standardization

Most companies have very different philosophies on the extent of standardization across its processes and information systems. Specific areas of business, regional and global divisions may all have different work processes and information systems, etc. However, companies with non-standard processes, software, etc. may find the implementation of a new e-commerce initiative difficult due to differences in software versions, data flow, etc. Advantages of standardizing processes, software, etc. include:

- One common instance of software
- One common interface between important software packages (ERP systems, etc).
- Global distribution and update of software and processes
- Online training, documentation, and communication can all take place through a standard interface

Applicable Cases: Case Study 4

1.3.8 Pilot Projects

Prior to any large investment in an e-commerce solution, companies should arrange pilot runs first to quantify the benefits that can be achieved and identify the processes that are affected. The success of the pilot is dependent not only on the functionality of e-commerce solution, but also of the capabilities of the people, processes, and resources allocated to the initiative. The upfront effort in planning a pilot is time-intensive, which may limit the number of pilots that companies can execute within a given period of time. In addition, employees of the company may find it difficult to constantly learn different solutions and systems in the pilot environment. However, several leading companies in the construction industry believe that exploring different vendor solutions is an extremely valuable way to learn how the solution will impact processes and people. Furthermore, pilots raise general awareness and the ability of workers to interact with new sources of technology.

Applicable Cases: Case Study 2, 4

1.4 Elements of Evaluation

Evaluation of e-commerce solutions was an important step for all the companies. However, evaluation was not reserved as the last step in the implementation process; rather it was an on-going process that occurred internally. It was at this stage that the companies determined if their attention to the details of planning and implementation resulted in the obtainment of pre-determined goals.

1.4.1 Return on Investment

The process of evaluating the e-commerce solution is a critical component of determining the future direction of its use. During implementation, it is important to set up stages/dates for an evaluation of the tool, the new process, and the users. These reviews should be realistically planned to provide enough time for tool usage, so that the established metrics are of significance.

All companies interviewed realized a return on their investment in the tools that were implemented. Some of the assumptions established for savings models had to be adjusted up or down to account for what was actually achieved, but all companies realized savings. In addition, each company had to take a more objective look beyond just the savings realized and determine if they had received the full benefits of the initiative that they were anticipating they would get.

Applicable Cases: Case Study 1, 2, 3

1.4.2 Time Savings

All companies interviewed realized a significant reduction in the time required to do the respective transaction the initiative was designed to replace. Although the overall transaction time decreased, many of the transactions required more upfront work (e.g. in the specification of the good or service that was purchased). This increased up front work is particularly noticeable when an item is more of a specialty-engineered piece of equipment.

Applicable Cases: Case Study 1, 2

1.4.3 Benefits of Increased Collaboration

Companies thought that, in most cases, the relationships they had with their suppliers improved. This improvement resulted from the companies working with their suppliers in the design and specification of the new initiative. In addition, it was thought that the increased collaboration resulted in a more efficient value chain and an increased competitive advantage.

Applicable Cases: Case Study 1, 2

1.4.4 Willingness to be on the Cutting Edge

All of the companies interviewed realized it would be a mistake to wait until they had all the details figured out about their initiative before rolling it out. The willingness to forge ahead with plans that were sometimes less than fully developed was a characteristic of all the companies interviewed. All firms thought the e-commerce landscape was changing so quickly that to wait for a 100% solution would mean they would wait forever. This does not mean the companies

forged ahead without a plan. In order to cope with the uncertainty of their new initiatives, companies established a rigorous check and balance approach to implementation. Companies would evaluate the progress of their initiatives at specific intervals of time. At these intervals, the companies would carefully evaluate the progress to date as well as determine what steps still needed to occur.

Applicable Cases: Case Study 1

1.4.5 Underlying fear from a supplier's point of view

In all cases, companies had to address fears from suppliers regarding the new e-commerce solutions. In most cases, supplier fears centered on the loss of pricing power. Companies had to work hard to overcome this resistance. Providing transition assistance to suppliers went a long way in resolving some of those fears.

Applicable Cases: Case Study 1, 2

1.4.6 Increased Data Collection

In all cases, companies were able to gather more transaction data after their initiatives were in place. This new data enabled the firms to establish more quantitative based performance metrics. In addition, increased data meant more negotiating leverage when dealing with suppliers. Instead of only knowing the yearly spend amount with a supplier, a company could know the yearly spend and specific volumes of individualized items. Negotiations could then be made on a per item basis with the knowledge of precisely what was purchased.

Applicable Cases: Case Study 1

Table 1.2: Elements of Planning

	Case Study #1 MRO Procurement Tool	Case Study #2 Reverse Auctions	Case Study #3 RFI Tool	Case Study #4 A Leader's Perspective
Development of a Multi-Disciplinary Core Team	●	●	●	
Problem Identification	●	●	●	
Scalability of the New Initiative	●	●		
Determining Extent of Integration	●			
Compatibility of Technology and Infrastructure with Suppliers	●	●		
Software Vendor Selection Criteria	●	●	●	●
Process Mapping	●	●	●	
Identifying Stakeholders	●	●	●	
State of Industry/External Evaluation	●	●		●

Table 1.3: Elements of Implementation

	Case Study #1 MRO Procurement Tool	Case Study #2 Reverse Auctions	Case Study #3 RFI Tool	Case Study #4 A Leader's Perspective
Upper Management Buy-In and Support	●	●	●	
Training and Change Management	●		●	
Aligning the E-commerce Initiative with Corporate Culture	●	●		
Accountability of core Team During Implementation	●		●	●
Assisting Suppliers	●	●		
Establishing Metrics	●	●	●	●
Standardization				●
Pilot Projects		●		●

Table 1.4: Elements of Evaluation

	Case Study #1 MRO Procurement Tool	Case Study #2 Reverse Auctions	Case Study #3 RFI Tool	Case Study #4 A Leader's Perspective
Return on Investment	●	●	●	
Time Savings	●	●		
Benefits of Increased Collaboration	●	●		
Willingness to be on the Cutting Edge	●			
Underlying Fear from a Supplier's Point of View	●	●		
Increased Data Collection	●			

CHAPTER 2: CASE STUDY #1 - AN MRO PROCUREMENT TOOL

2.1 Purpose of Case Study

This case study looks at one company's entry into e-procurement. Entry into e-procurement can be challenging. Many companies are choosing to enter the e-procurement realm by investing in a tool that allows them to purchase indirect or Maintenance, Repair, and Operation (MRO) items more efficiently through the use of web-based catalogs. A significant driver for this decision is that implementation affects essentially low dollar purchases that many times have a large amount of individual transactions.

MRO/Indirect items include a wide range of goods and services needed for the day-to-day operations of the company's facilities. Examples include computer software, office supplies, laboratory and industrial equipment, etc. Direct items are the low-volume/high-cost products that are critical for the operation of a facility. Examples of direct items include essential capital equipment items such as boilers, coolant systems, compressors, pressure vessels, etc.

Many companies have avoided the MRO/Indirect materials when implementing an e-procurement tool because they see it as a small dollar transaction area. However, by starting with these catalog items, companies begin with a product type that is less controversial and easier to define than a specialty item. In addition, companies can learn many lessons as a result of the implementation of any e-procurement tool. Lessons learned can then be carried forward to e-procurement tools for other portions of the company's spending pool

2.2 Company Background

The company interviewed for this case buys raw materials, equipment, construction services and indirect materials. The company is considered a market leader in their industries, operating with over 18,000 employees in 30 countries. Annual revenues for the company are nearly 6 billion dollars.

All procurement functions for the company were organized around a central purchasing department. The department had negotiated national contracts with suppliers in an attempt to reduce total procurement costs. However, given an extensive list of field locations and somewhat ineffective communication processes, many of the purchases that were taking place were not necessarily done using the pricing scheme established with the contracts.

2.3 Motivation for the E-Procurement Tool

In this case, the creation of an e-procurement tool arose from a desire to save costs on the purchase of high-volume/low-cost indirect items. In terms of monitoring costs and savings, representatives from purchasing reported that, prior to the e-procurement tool; they were better equipped to purchase the low-volume/high-price direct products versus the MRO items. The new e-procurement tool was created to streamline the purchase of a select portion of the total indirect items purchased. The following business drivers were the primary reasons the company pursued an e-procurement tool:

2.3.1 Possible Migration to SAP

Within the company, there was substantial consideration around moving away from various legacy systems towards an SAP system. Within the company, there was considerable talk about moving away from an existing ERP system towards an SAP system. It was decided that any new electronic procurement tool should not be inextricably linked with the current legacy system in case SAP was later implemented. One employee in the purchasing department compared removing an application from the existing legacy system to removing a tree. There are roots everywhere. A stand-alone e-procurement tool would limit any integration problems in the future.

2.3.2 Globalization

The company was seeking a procurement tool that would enable them to leverage their current global presence. The company estimated that the savings realized on a national basis would be magnified more if they could streamline the procurement process in other countries in which they operate.

2.3.3 Varying Costs between Similar Procured Goods

Despite having national contracts in place, many requisitioners used the current procurement card system (see Section 2.4.2 for a description of the procurement card system) to purchase indirect items. Purchasers thought it was easier and more cost efficient for them to go to local distributors of indirect goods rather than use the national contracts that were in place. However, more often than not, it was determined that the purchasers were often paying a substantially higher price for indirect goods than if they were to follow the established national contracts. Substantial savings could be realized if all employees were to use the established national contracts.

A new e-procurement tool would allow the company to meet its goals in saving costs, becoming more efficient, operating competitively on a global scale, and clearing the way for a new corporate IT system.

2.3.4 Cultural Shift to a Competitive Bid Model

A cultural shift was occurring within the purchasing department. Unlike with direct product purchases, the existing procurement model for indirect products was not always based upon the competitive bid model. Due to resource limitations, supplier entrenchment and perceived significant cost of change, the company, at times, simply went back to the previous contract winner and renewed the contract. As a result, the company was not receiving the lowest possible price in their contracts.

The purchasing department rationalized if bidding worked for the larger direct product orders, it should also work for the higher-volume/lower-dollar value indirect orders. The company assumed if they could get 4-5 suppliers to bid on each indirect contract, a price reduction would occur.