# Corporate Managers' Experiences Related To Implementing Section 404 Of The Sarbanes-Oxley Act: A Focus On Information Systems Issues

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## ABSTRACT

*This article reports the experiences of corporate managers implementing the requirements of Section 404 of the Sarbanes-Oxley Act as it pertains to information systems. To carry out this research high ranking corporate managers were interviewed. Their firsthand experience with implementing the requirements of the Act provides valuable insight into some of the challenges and benefits resulting from the legislation.*

**Keywords:** Accounting, Information Systems, Sarbanes-Oxley Act, Section 404, Internal Controls, Audit

## INTRODUCTION

On July 30, 2002, a bill cosponsored by Paul Sarbanes, a Democratic senator from Maryland, and Michael G. Oxley, a Republican representative from Ohio, was signed into law. Lawmakers passed the Sarbanes-Oxley Act (SOX) in an attempt to protect the public from corporate corruption and restore investor confidence in the capital markets. SOX added new provisions and changed existing requirements of the federal securities laws, making it the most radical piece of legislation to affect corporations and the accounting profession since the Securities Exchange Act of 1934 (Koehn and Del Vecchio, 2004).

## EVENTS THAT LED TO THE PASSAGE OF SOX

In August 2000, the stock of Enron had reached an all-time high but in less than eighteen months, after reaching that high, the company filed for bankruptcy (Berkowitz, 2002). This dramatic event spurred an investigation that uncovered grossly inflated earnings and what Whittington and Pany called "accounting irregularities" (2004, p. 9).

With the demise of Enron, over $70 billion of investors' money and 4,500 jobs were lost (Elkind and McLean, 2006). Arthur Andersen LLP, Enron's external auditor, was charged with obstruction of justice related to the destruction of Enron documents (Berkowitz, 2002). Surprisingly, accountants who were highly regarded for maintaining high ethical standards were accused of participating in criminal behavior. Auditors who were once held in high regard were now viewed as ineffective and complacent (Beasely & Hermanson, 2004).

Shortly after the Enron scandal, the public's doubts about the accuracy of financial reporting and the independence of external auditors were reinforced by the investigation of another corporate giant also audited by Arthur Andersen: WorldCom. WorldCom overstated reported earnings for a two-year period by $7 billion, resulting in the largest bankruptcy in U.S. history (Whittington and Pany, 2004). The hardest hit group was WorldCom employees. At the time of the bankruptcy, 40% of employee 401(k) plans consisted of WorldCom stock (Jacobius, 2002). When the company went bankrupt, employees lost $775 million in retirement benefits (Jacobius, 2002).

The events of Enron and WorldCom not only caused an erosion of confidence in the capital markets but also created what Whittington and Pany call a "crisis of credibility" for the accounting profession (2004, p. 10). A profession that was once highly regarded and whose members were one of the most credible was now shrouded by mistrust and skepticism (Tackett, 2004). Raiborn & Schorg (2004) describe the growing distrust in the auditing profession as "a cancer that is metastasizing" (p. 11).

According to Carmichael (2004) the passage of the Sarbanes-Oxley Act (SOX) was the federal government's reaction to major fraud that occurred at companies such as Enron and WorldCom. SOX was designed to not only strengthen internal controls but also to regulate the accounting profession. SOX was passed to ensure that auditors maintain a level of skepticism related to the assertions of management and remain independent (Kleckner, 2004).

## SCOPE AND IMPORTANCE OF THE RESEARCH

This research focused on Section 404 of the Sarbanes-Oxley Act as it pertains to information systems. Of the sixty-six pages of text contained in this legislation, Section 404 has caused the most concern (Greifeld, 2006). According to Gifford and Howe (2004), too little thought was initially given to the cost and difficulties of implementing SOX. Critics of this legislation argue that the consequences of implementing SOX may be more severe than legislators anticipated (Gifford & Howe, 2004; Koehn & Del Vecchio, 2004).

Corporate management and internal auditors charged with implementing the requirements of this legislation are significantly impacted, as are external auditors of publicly traded corporations who must attest to management's compliance with the requirements of Section 404 of SOX as it relates to information systems. Implementation of this Act is costing corporations billions of dollars annually (Block, 2004; Calmes & Solomon, 2004; Swartz, 2004), which affects a company's profitability and may make American companies less competitive in the world marketplace.

## OVERVIEW OF LITERATURE

There has been limited research published about the challenges experienced and benefits derived from implementing Section 404 of SOX related to information systems. The literature has addressed some of the unanticipated consequences of this legislation. Researchers have reported on the excessive cost of implementation (Beasley and Hermanson, 2004; Block, 2004; Swartz, 2004), the increased cost of accounting services (Gifford and Howe, 2004), the decline in the number of companies going public (Gifford and Howe, 2004) and public companies going private (Deutsch, 2005). However, the literature has not adequately addressed the challenges and benefits experienced by corporate managers in implementing Section 404 of SOX as it relates to information systems.

Swartz (2004) reports that US companies are finding that complying with Section 404 of the Sarbanes-Oxley Act is very costly. Companies are reporting that millions of dollars are being spent evaluating systems that are already in place. Resources, both time and money, are being diverted from other activities to internal control testing.

According to Lanz and Tie (2004), few factors have influenced the business decision to outsource information technology (IT) services as much as the Sarbanes-Oxley Act. On the other hand, the Sarbanes-Oxley Act can be viewed as an opportunity for companies to become more efficient, increase their value, raise corporate integrity, and restore investor confidence (Quall, 2004).

Very limited research is available addressing the additional information system controls necessary to meet the requirements of SOX. Ge and McVay (2005) identify system access and system security as areas of concern. They also note that information technology policies and procedures need to be better documented.

## RESEARCH METHOD

In October and November of 2005 a sample of corporate managers charged with implementing the requirements of Section 404 who were from eight different corporations located in Southwestern Pennsylvania were interviewed. The positions held by these individuals are contained in Table 1. Challenges, benefits and control concerns related to SOX were addressed in the interviews.

All eight corporations represented were publicly traded on U. S. exchanges and were audited by "Big 4" accounting firms. All eight companies were judged fully compliant with no material weakness in internal controls identified in the most recent year with regard to Section 404 of the Sarbanes-Oxley Act and all received unqualified opinions on the financial statements from their external auditors.

**Table 1**
**Companies, Participants, and Positions**

| Company | Participant | Position |
|---|---|---|
| 1 | 1 | Director of Internal Audit |
| 2 | 2 | Director, Information Systems |
| 3 | 3 | Director, Information Systems |
| 4 | 4 | Vice President, Corporate Audit |
| 5 | 5 | Manager, Internal Audit |
| 6 | 6 | Managing Director of Internal Controls Analysis |
| 7 | 7 | Director, Internal Controls |
| 8 | 8 | Manager, SOX Compliance |

## SOX COMPLIANCE PROCESS

The eight companies that participated in this research developed procedures to comply with Sections 404 as it pertains to information systems. A composite model of the steps taken by the companies was developed and is depicted in Figure 1. These steps are explained in the sections that follow.

### Determine Which Systems are in Scope

The first step in making information systems compliant is to develop criteria for determining which systems are in scope i.e. the systems that should be included in the SOX review process.

Participants were asked to identify the key, high-risk accounting information systems within their organization. If a breakdown in internal control should occur in a key system, a material misstatement in the financial statements could arise. According to Arens, Elder and Beasley, "a misstatement in the financial statements can be considered material if knowledge of the misstatement would affect a decision of a reasonable user of the statements" (2006, p. 56). Participants responded to this question in a variety of ways.

Some participants identified the financial applications of the Enterprise Resource Planning (ERP) systems such as SAP and Oracle as a key system because it is used throughout the organization and supports all financial statement accounts.

The criteria used by one participating company for determining which systems were in scope, was based on the balance in the related financial statement account. At this company any financial line item over $60 million was considered in scope and any line item under $5 million was considered out of scope. Account balances between $5 and $60 million were individually evaluated to determine if they should be included in the testing. Once an account was identified as being financially in scope, all the information technology applications that supported that account were also in scope.

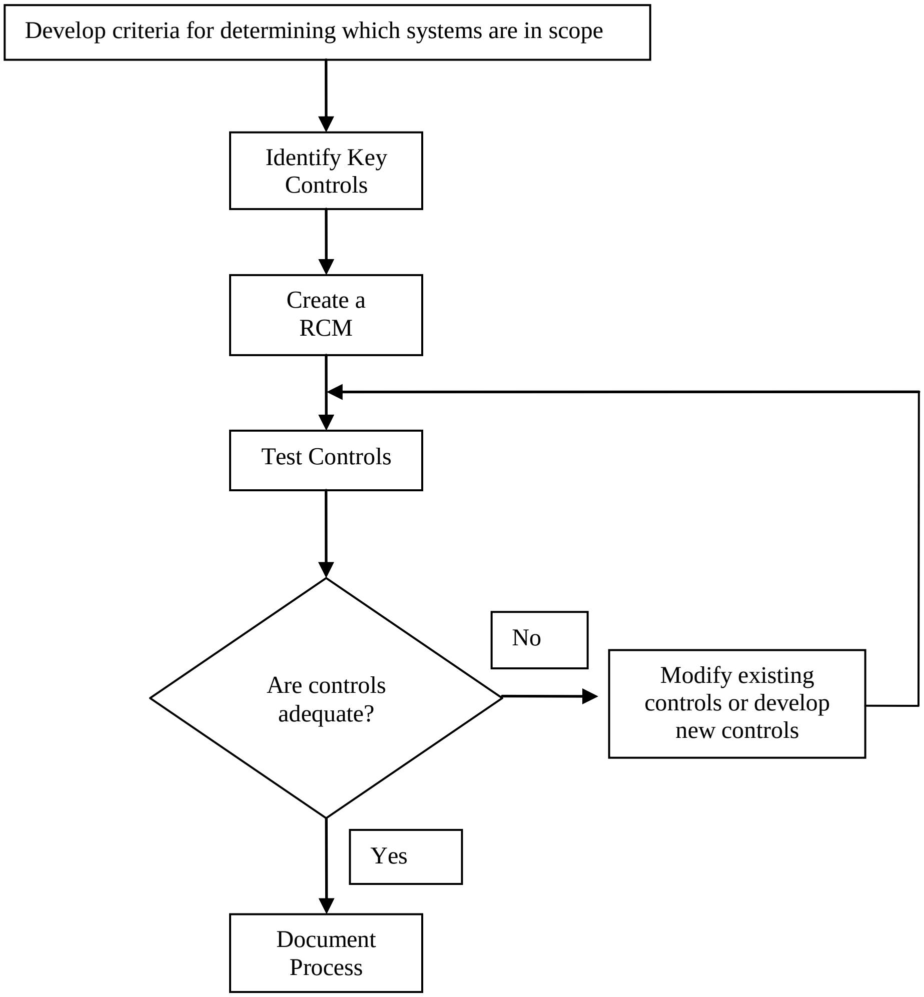
Develop criteria for determining which systems are in scope
Identify Key Controls
Create a RCM
Test Controls
Are controls adequate?
No
Modify existing controls or develop new controls
Yes
Document Process

**Figure 1: Composite Model of SOX Compliance Process.**

One participant identified the systems with the most risk as the system that consolidates data from all of the company's various entities. In addition to the domestic systems, all the financial systems of the foreign operations are also in scope, creating a unique challenge because these systems may be written in foreign languages.

At one of the participating companies a shared service center group exists for the general ledger, accounts receivable, accounts payable, project accounting, and fixed assets. These areas are viewed as high risk because an error or irregularity occurring at a shared service center will affect all company locations and is potentially damaging.

**Identify Key Controls**

Once it was determined that a system was in scope the next step in the compliance process was to identify the key controls of the system. Participants were asked to identify the most important controls for the key accounting information systems within their organization and the misstatements these controls were designed to prevent or detect.

One participant identified systems access and segregation of duties as key controls. Systems access relates to who has access to the system, how access rights are acquired, and how access is controlled. Another participant reported that the most important controls were general IT controls. Change management and backup and recovery were considered important. This participant explained that several higher level application controls were also key. Controls to prevent the payment of an invoice unless supported by a purchase order and a receiving report were performed systemically. The remainder of the controls included analytical reviews and trend analysis.

Weekly and monthly analytical reviews of various accounts were identified as a key control by another participant. The reviews were part of the cost analysis performed by the company to identify material misstatements. Another key control identified is the analysis of the end of month accruals associated with various expenses. This analysis is performed during end of month closing to ensure that the amount of the expense seems appropriate or correct, based on the business in the past month.

### Create a Risk Control Matrix

Once the key controls were identified the next step in the compliance process was to create a risk control matrix (RCM). Various types of RCMs were used by the participants of this research project. RCMs were created internally and/or were developed by "Big 4" accounting firms or software development companies. A RCM that identifies the key controls of the system, contains a description of the control, and identifies the risk the control is designed to mitigate should be created for each system.

Participants explained that the RCM for the general computer controls includes security, operations, and change management. According to one participant more than half the controls that were implemented as a result of SOX relate to change management. In the security area there were some technical controls added such as password change frequency, physical security controls, and a more rigorous backup management process.

One company developed internal controls standard practices to use throughout the organization. A list of key controls is included in the system's documentation, along with an explanation of how key controls are met. Each system is assigned a high, medium or low risk assessment rating. After the assessment rating has been assigned, external auditors use a standard program that reviews, tests, and validates all the results in the control documentation.

One company created a list of key systems containing every system that runs within the company, what platform it runs on, what it does, and the impact, if any, on the financial statements. This company also designed and implemented a SOX database that houses all the data related to the key controls including the documentation.

One company developed a self-assessment tool for key processes such as revenue, fixed assets, and inventory. All the controls that exist for each process are included and the SOX specific controls are identified. These controls are developed and tested on an annual basis. Testing must be completed before the end of the third quarter so that any deficiencies can be remediated in time to be fully compliant with Section 404 for the year.

Once identified, the key controls were tested to determine adequacy. If it was determined that a control was not adequate the control was modified or new controls were developed. The modified or new controls were then tested again. This cycle was repeated until it was determined that the control was adequate. Once the control was deemed adequate the process was documented.

## FINDINGS

Sec 302(a)(4)(C) of the Sarbanes-Oxley Act requires the signing officer to "…have evaluated the effectiveness of the issuer's internal control as of a date within 90 days prior to the report;.." This requirement has caused many companies included in this study to adopt a policy of not implementing new systems in the fourth quarter of the year.

Delaying systems implementation was one of the greatest challenges participants reported related to systems. This challenge was compounded by the fact that one of the participating companies does not launch any new application during its peak season in the months of October through December because pulling resources to implement new software during a company's busiest time would not make good business sense.

**ERP Software Used at Participating Companies**

The companies included in this research used a variety of Enterprise Resource Planning (ERP) software in their operations. At one of the participating companies an SAP system was implemented before the passage of SOX when management's focus on the control environment was not strong and the focus of the internal audit department was more on cost savings than controls. When SAP was first implemented at this company, management's goal was to implement it cheaply and have the system run as efficiently as possible. As a result, some system controls were sacrificed for a faster, more efficient system which compounded the remediation efforts.

A challenge faced at one of the participating companies was that three different internally developed ERP systems are being used throughout the company. The company has grown through acquisition, and the independent systems were in place when the smaller companies were acquired. The company did not have a common set of policies, procedures, or controls that were adhered to across the organization. The company has yet to identify which of the three ERP systems is strong enough to adopt as the standard platform for the organization. The use of multiple systems creates unique challenges related to the implementation of Section 404.

One of the greatest challenges reported by participants was restricting system access and the segregation of duties. When SAP was originally set up at one of the participating companies, access for the users was broader than necessary. At the time of this study the company had not yet gone through the process of determining appropriate access. As a result, this company is keeping the monitoring reports in order to have managers verify that no one is posting in an area where they should not be.

One of the participating companies does not use an enterprise wide software reporting program. There are numerous "homegrown systems" within the organization which has presented significant challenges to this organization.

**Use of Third-Party Software**

Statement of Auditing Standard (SAS) No. 70 applies to service organizations that develop software used by entities subject to audit. SAS No. 70 and SOX require that third-party vendors be compliant. This requirement creates unique challenges for companies that use third-party software. One of the participating companies used software developed by a small "mom and pop" company for an expense account that was in the scope of SOX. As a result, this company incurred the additional cost of a consultant to develop IT general controls to bring the software developed by the "mom and pop" company into compliance with SOX.

**The Cost of Compliance**

The cost of compliance was mentioned as a challenge by all participants. The two smallest companies in this study found the cost of compliance unfairly burdensome. Three of the participants noted that at their companies serious thought is being given to taking the companies private.

Participants were not able to determine the exact cost of compliance. In many cases the amounts provided include only the cost of the external auditors and consultants. Each participant attempted to estimate internal cost but admitted that the estimate did not include the cost of management's time taken away from other necessary activities of the business and diverted to SOX related issues. This is consistent with the results reported by PriceWaterhouseCoopers of a survey of senior executives where fifty-six percent of respondents reported that the internal cost of SOX and other compliance programs was not reported (PriceWaterhouseCoopers, 2004).

### International Operations

All companies represented in this study have international operations. Six of the eight participants stated that having international operations presented unique challenges related to SOX. Participants reported that because SOX requires a high degree of coverage at so many locations, employees must travel to all locations each year to insure systems are compliant.

Because the companies included in this study were very dispersed geographically, travel was required to the different locations, increasing the cost of the SOX effort significantly. Participants also reported that it is difficult for foreign companies to understand the implications of SOX and computer systems and processes at foreign companies often differ from those in the U.S.

One participant reported that its European operations' accounting information systems consists of numerous spreadsheets. These spreadsheets were constructed with complex formulas that tie into numerous other spreadsheets. Because of the way spreadsheets were constructed, it was difficult to install controls.

### Staffing

Participants identified staffing as a significant challenge faced in their organization. A significant amount of qualified staff is required on the financial side and the IT side to comply with the requirements of SOX. With the demand for qualified accounting and information systems personnel rising, participants expressed concern that universities were not supplying industry with an adequate number of qualified personnel, causing hiring costs to increase. According to Ge & McVay (2005) "a common cause cited for material weaknesses is lack of qualified accounting personnel" (p. 138).

### Change the Mindset of IT Professionals

According to the participants of this study, a change in the thinking of IT professionals is necessary in order to assist an organization in becoming SOX compliant. Traditionally the IT department is a service organization and IT professionals think in terms of delivering a service; however, SOX is an audit driven function. To meet the requirements of SOX, the service delivery model should be replaced with a control model that asks the following questions: What controls do you have in place? What audit trails do you have? What evidence are you collecting? Combining the language and thought process of an auditor to that of a service organization is a challenge. In addition to satisfying the needs of the client, IT personnel must think about what controls need to be included in the process and what has to be done to collect the evidence to demonstrate SOX compliance.

SOX has caused the IT staff at participating companies to look at tasks differently. The IT staff in an organization typically does not have a financial accounting or audit background. Documenting and testing of the internal controls was something with which they were unfamiliar. This made the creation of a risk control matrix difficult because without the financial accounting or auditing background, IT personnel did not understand what a control is and how it is tested. In an attempt to overcome this obstacle, the audit staff at some companies conducted training sessions for staff members who did not have audit expertise. At some companies business systems analysts and project managers who facilitate application development worked with the IT staff to develop risk control matrices.

### Greater Awareness of Controls

The culture of the organizations that participated in this research changed as a result of SOX. Employees are much more aware of controls and much more conscientious about controls when they are putting in a new process. In implementing a new process they now think about internal controls and discuss the process with internal audit.

### Training Programs

Several of the participants considered the additional training that is being offered to employees as a benefit of SOX. At one of the participating companies the staff conducted training sessions regarding SOX and internal controls that all managers and supervisors were required to attend. At another company a "guest auditor" program was developed. The participant explained that it is important to internal control that not only are procedures in place but also that employees understand what internal controls are, and their role in the compliance process.

### Better Defined Processes

One participant reported that as a result of SOX, a better defined process for system implementation has been developed. Before a new system can be implemented a detailed project description is required and the methods of testing are identified. The new process helps to eliminate inconsistencies in systems development and improves service delivery.

One participant reported the most significant benefit derived from the requirements of Section 404 related to information systems was the development and implementation of more formalized practices. Documents such as logs were created to show who used the system, who made changes to the system, what changes were made, and whether proper authorization was given for the change. SOX has caused this company to formalize and document good practices that were already in place.

### Cleaner Closing Process

One reported benefit of SOX was the closing process is "cleaner," reducing the quarterly closing error rate by one third. Because SOX employees are paying closer attention to their work, many of the mistakes that occurred in the past have been eliminated, thus reducing the numbers of errors in the system.

### Additional Information Systems Controls Implemented

All participants in this research study reported that their company focused more on general controls than application controls in the first year that SOX was implemented. Several mentioned that this was at the advice of their external auditor. Specifically, the review focused on the general controls of systems access, change management, segregation of duties, and disaster recovery. Participants felt that in subsequent years the focus would shift to higher level application controls.

At one of the participating companies the duties in the system development lifecycle of system development, testing, and implementation had to be segregated. This segregation required the hiring of additional employees because it could not be accomplished with existing staff. Also, a business process owner was assigned to each transaction code in SAP. The business process owner is required to review everyone that has access to that specific code and to certify each quarter that the review has been done.

One of the participating companies purchased a software tool to help control system access and segregation of duties in its Oracle system. This tool reviews all the Oracle access settings and produces a report highlighting potential segregation of duty issues.

One participant reported that the major change related to information systems as a result of the requirements of Section 404 was the implementation of a robust documentation retention process. One major change was using PeopleSoft throughout the company. As a result of this change testing time was significantly decreased.

A major change made at one of the participating companies as a result of the SOX compliance efforts was to centralize the general accounting systems. Because the system is centralized and testing occurs at the corporate level, subsidiaries are not required to test the main components of the system; only those unique aspects of the system at their location.

### Changed the Way Business Acquisitions are Viewed

This research found that SOX compliance has changed the way companies view potential business acquisitions. Participants reported that the thought process in buying a company has changed. The information systems in place at the potential acquisition are now extensively examined. A company considered a desirable acquisition according to all other financial measures may not be purchased if the cost to make its information systems compliant is too great.

## DISCUSSION

Ardent supporters of SOX, such as Bob Greifeld, president and chief executive officer of the National Association of Securities Dealers Automated Quotation (NASDAQ), who was once convinced that, "…the benefits of SOX would prove compelling and unassailable," is now admitting, "I was dead wrong" (2006, p A14).

The primary purpose of Section 404 of the Sarbanes-Oxley Act was to enhance the control environment and mitigate risk, but what has been reported by participants of this study is somewhat different. For the companies that participated in this study, the most desired outcome was to satisfy the external auditor and be judged compliant with Section 404.

Companies sacrificed performing activities that would enhance the control environment and instead performed activities not seen as value added just to satisfy the external auditor, resulting in audit coverage becoming more important than controlling risk. Corporate managers find themselves facing the dilemma as to whether to address the area where they know risk exists or to do what satisfies the external auditors. Unfortunately, the reality of the situation is that managers do what they must to satisfy the external auditor and, because of limited resources, sometimes walk away from an area where they know risk exists.

Participants in this study felt that external auditors may not be the best judges of the internal control structure that should be in place at a company. According to participants in this study, the external auditors' budget and time allotted for the audit engagement does not allow them to become very knowledgeable about the internal control structures of the businesses they audit. Participants felt that without an in-depth understanding of the business, external auditors cannot really understand what kind of control environment is needed.

With regard to information systems, SOX has diverted resources away from systems upgrades and programming changes, which management deems necessary, to activities viewed as non-value added such as developing the correct management report.

Participants felt many companies will not be able to sustain the current levels of: the additional time required to comply with Section 404, the redeployment of key personnel to compliance related activities, and the additional costs incurred. Many in this study reported, consistent with Gullapalli (2004) and Calmes & Solomon (2004), that SOX compliance efforts have distracted key management personnel from activities more beneficial to the business organization. All companies in this study reported costs incurred are more for compliance related activities than for value-added activities.

### Benefits

The benefits reported by participants of this study in implementing SOX are the following: a heightened awareness of controls throughout the organization, more formalized training programs, and more consistent documentation of processes and procedures.

### Information System Changes

Participants reported that the primary challenge related to information systems is the restriction of scheduled implementations of new systems and the hesitation to acquire companies with older, noncompliant systems. U.S. companies may find themselves at a competitive disadvantage because a system implementation that would lead to more efficient operations or improved customer relationship management must be postponed until a time when it can be made SOX compliant before year end. In addition, companies may not be acquired because the cost of making existing information systems SOX compliant may be too great.

### Advice from Corporate Managers

According to participants in this study the most complex and costly component to document and test in SOX compliance is the information system component. In addition, information system changes require the longest time to implement and deficiencies in internal control require the longest time to remediate.

Information systems should be considered one of the high risk areas. Early in the systems review process, corporate managers should develop a formal review process for information system additions and changes. Time is needed to determine the extent of compliance, determine the required remediation, test, and retest. The cost associated with making the information systems compliant will be the greatest cost of the SOX compliance effort. Companies may be forced to hire an outsourced IT service provider because internal audit departments typically do not have the expertise in IT or understand the IT control environment.

## SUMMARY

Among the most significant challenges experienced by the participants of this study were the following: challenges related to excessive costs and time required to implement and make information systems compliant, staffing, and difficulties implementing Section 404 in international operations.

The most significant benefits experienced by participants of this study included a greater awareness of controls at all levels of the organization, the development of formalized training programs, and better defined processes.

Additional general computer controls were implemented by all participating companies in this study, with systems access and segregation of duties given the highest priority. All participants noted that, as a consequence of Section 404, system documentation has improved. Of particular importance is the effect that Section 404 is having on the timing of implementation of new systems or the upgrading of existing systems.

The adoption of the Sarbanes-Oxley Act of 2002 was in direct response to corruption uncovered in U.S. corporations resulting in losses for investors, employees and the public. The law was created to restore investor confidence in the capital markets and ensure the independence of external auditors. The law was meant to protect the public, but how will those being protected benefit if the cost of implementing SOX drives companies from the public markets or out of the United States? While this research study took an in-depth look at challenges high-level managers experienced with implementing the Act, the gravity of the possible consequences of SOX nationwide warrants future research and discussion.

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## NOTES