

Sarbanes-Oxley compliance: evaluating application and IT infrastructure controls realistically and efficiently

About this white paper

The U.S. Sarbanes-Oxley Act of 2002 is bringing about far-reaching reform of business practices, and sets challenging new standards for the accuracy, completeness and timeliness of financial reporting.

Business, IT, or security staff concerned about the controls applied to IT-based information systems need to understand what the Act calls for. Conversely, teams engaged in achieving compliance with the Act need to understand the latest research about the controls applied to IT-based financial systems.

This paper is aimed at both groups. It explains the Act in broad terms, highlights the danger of unrealistic evaluations, and shows how the measurement and management processes built into **Citicus ONE** can be used to evaluate the completeness and effectiveness of controls applied to financial systems realistically and efficiently, so as to provide real business benefits.

Benefits of Sarbanes-Oxley compliance

The purpose of the Act is to protect the interests of investors and to serve the wider public interest, by:

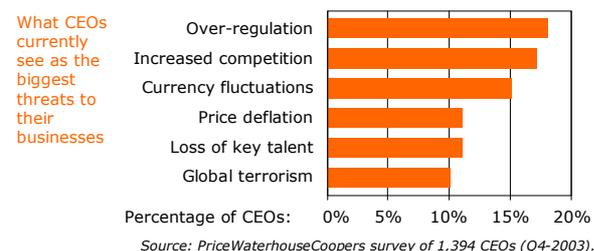
- outlawing practices that have proven damaging (eg over-close relationships between auditors and management)
- requiring companies to comply with onerous new standards of practice for financial reporting
- intensifying penalties for misleading investors (eg fines of up to \$5 million or 20 years in jail for issuing financial reports that do not meet Sarbanes-Oxley requirements).

For senior executives, therefore, the benefits of compliance are personal and very direct.

Costs of Sarbanes-Oxley compliance

Analysts have estimated the 2004 cost of compliance as \$3-8 million for a Fortune 500 company; \$5.5 billion for U.S. listed companies in total. Most of this will come off companies' bottom lines.

Thus, it is not without cause that CEOs around the world now see 'over-regulation' as a major threat to their businesses, as shown below.

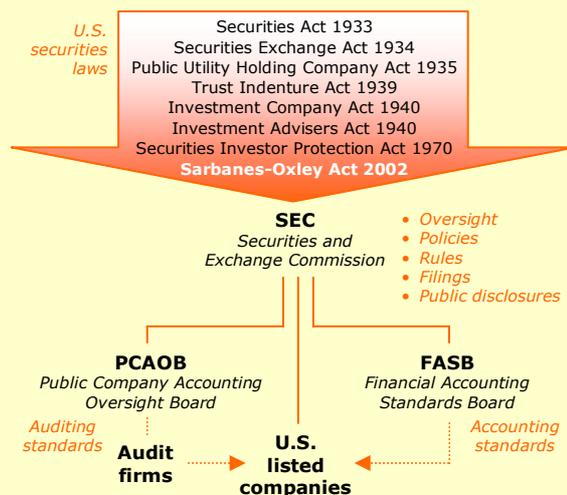


Broad thrust of the Sarbanes-Oxley Act

The Act that U.S. Senator Paul Sarbanes and Congressman Michael Oxley co-sponsored became law in 2002, following the Enron disaster. Its aims were to restore confidence in 'corporate America' and to protect investors by changing the way business is run and how results are reported by companies listed on the major U.S. stock exchanges. To these ends, it:

- established a new body to oversee audit firms (PCAOB)
- strictly limits what accounting firms can do for their audit clients
- empowered the SEC to oversee the accounting standards-setting process via the FASB
- requires U.S. listed companies to establish powerful, independent audit committees
- requires CEOs and CFOs personally to certify their financial reports and the effectiveness of internal controls over financial reporting
- requires strict segregation of securities analysts from investment banking activity
- raised penalties for violations of securities laws and SEC rules, and introduced new ones
- initiated studies heralding further changes in future (eg shape of the accounting industry).

The new landscape for corporate governance in America created by Sarbanes-Oxley is shown below.



The Act applies to subsidiaries of U.S. corporations based all over the world; and to non-U.S. companies that are listed on major U.S. stock exchanges. It is also influencing developments in other jurisdictions.

Thus, directly or indirectly, Sarbanes-Oxley affects or will affect corporate governance practices worldwide.

Financial reporting requirements

Sarbanes-Oxley requires CEOs and CFOs¹ to certify the accuracy and completeness of the information they publicly disclose via the U.S. Securities and Exchange Commission (SEC). This includes quarterly, half-yearly and annual reports on their enterprise's financial condition, cash flows and activities.

Its aim is to make top executives personally responsible for the information they provide to actual and potential investors, banks, customers, suppliers and other interested parties. Certification requirements are onerous, as can be seen from the outline below.

What CEOs / CFO's must do

1. Review the information provided in each filed report.
2. Confirm that the information in the report:
 - a) is accurate and complete (ie it contains no material untruths or omissions)
 - b) fairly represents the enterprise's financial condition, cash flows and activities.
3. Confirm that they are personally responsible for establishing and maintaining adequate controls over financial reporting and that they have ensured that:
 - a) controls are designed to provide reasonable assurance about the accuracy and completeness of the information provided, and its compliance with generally-accepted accounting principles
 - b) the effectiveness of disclosure controls in force at the end of the reporting period is evaluated, based on a recognized control framework²
 - c) any material changes to internal controls over financial reporting that occurred in the last quarter are disclosed in the report
 - d) their audit committee and auditors are advised of:
 - i) significant or material control weaknesses likely to affect the recording, processing, summarizing or reporting of financial information
 - ii) cases of fraud involving employees concerned with controls applied to financial reporting.

¹ Certification is required by 'principal executive officers' and 'principal financial officers' of listed companies. Some companies have slightly different requirements.

² The Committee of Sponsoring Organizations (COSO) of the Treadway Commission's Internal Control -- Integrated Framework, 1992, or equivalent.

For major U.S. companies, these requirements apply in full to annual reports due from mid-June 2004 onwards and to other filings thereafter.

Is a clean bill of health realistic?

Certifying the adequacy of controls over filings requires detailed evaluation of the controls applied to business processes that support financial reporting, such as those below.

Business processes that support financial reports

Sales (customers, orders, invoicing, receipts)	Accounts receivable
Purchasing (suppliers, orders, invoicing, payments)	
Human resources (employees, time worked, expenses, pay / tax due / paid)	Accounts payable
Inventory (goods received / returned / issued; valuations and cost accounting)	Current assets
Treasury (bank accounts, loans / borrowings, investment dealings)	
Fixed assets (acquisitions, depreciation, disposals)	Fixed assets

Such processes are generally carried out using IT-based **business application systems**, supported by **IT infrastructure** such as data centres and networks at corporate, regional, national or local level.

A solid, up-to-date understanding of what makes the controls applied to both **application systems** and **IT infrastructure** effective is therefore essential.

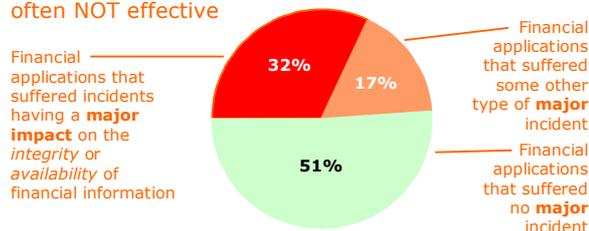
Put bluntly, without such an understanding, any evaluation of the adequacy of the controls applied to financial reporting is likely to be incomplete and may well be grossly misleading.

This is because recent, independent research³ shows that even in leading companies:

- when it comes to business-critical applications and IT infrastructure, **control deficiencies are the norm not the exception** (on average, the controls applied to business-critical financial systems are only fractionally better than those applied to other applications)
- as a result, on average there is a **49% chance in any one year of a financial application suffering a major information incident** ie one that compromises the integrity, availability or confidentiality of the information that it handles.

In fact it is the **integrity** and **availability** of information that such incidents typically compromise, as can be seen in the chart below.

Controls applied to financial application systems are often NOT effective



Source: Citicus analysis of data about major incidents affecting 179 critical business applications that support financial reporting, over the course of a year. ³Base data is from the Information Security Forum's 2000-02 information security status survey.

These findings stem from the world's most advanced survey of the controls applied to business-critical systems. Few control evaluators have an in-depth understanding of these statistics or their implications.

Without this know-how, there is a real danger of their under-estimating or exaggerating the significance of control weaknesses and of issuing evaluation reports that are superficial and not in tune with reality. This may lead to CEOs and CFOs issuing misleading Sarbanes-Oxley certifications – with all that implies.

Evaluating IT-related controls realistically

Citicus ONE is an award-winning evaluation tool that encapsulates years of research into what makes IT-related controls effective. Evaluators can use it to evaluate the controls applied to IT-based application systems and infrastructure **reliably** and **efficiently**.

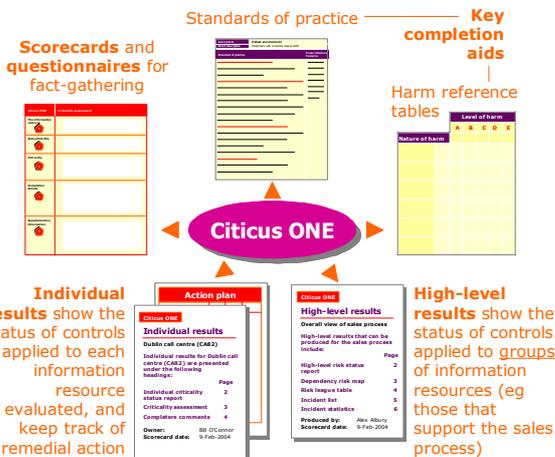
Its capabilities are summarized on the following pages, along with an explanation of how it supports compliance activity.

What is Citicus ONE?

Citicus ONE is a proven, web-based system for managing 'information risk' across an enterprise (ie the chance or probability of the enterprise suffering harm as a result of a loss of the integrity, availability or confidentiality of information). It is designed to:

- equip evaluators to measure reliably the completeness and effectiveness of the controls applied to IT applications and infrastructure, and the level of risk these pose to the business
- encourage and assist system 'owners' to drive risk down to an acceptable level.

As illustrated below, it does so by presenting polished scorecards, questionnaires, and completion aids; and producing succinct, business-oriented results that can be readily understood by those involved in bringing controls up to the required standard.



Citicus ONE's scorecards, questionnaires, and completion aids enable evaluations to be carried out efficiently and to collect information reliably. Their form and content reflect:

- solid statistical insights into what makes the *controls* applied to critical systems effective
- detailed study of what makes *risk assessment and management processes* effective.

Its unique research base shows up in the graphical risk charts, risk maps, league tables and risk management reports produced by **Citicus ONE**. These provide evaluators, owners and other decision-makers with clear, concise facts about:

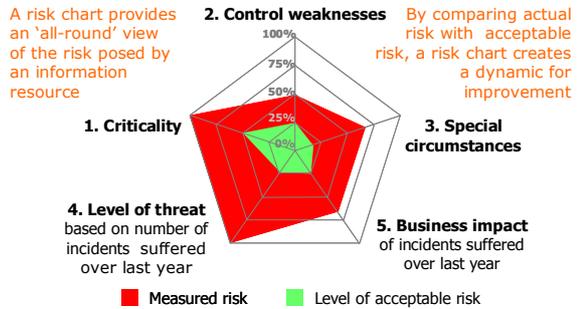
- the extent of control weaknesses and their significance (ie how much harm *could be* caused as a result of the weaknesses found)
- the likelihood of incidents occurring that compromise the integrity, availability or confidentiality of business-critical information
- progress with remedying control weaknesses.

To aid evaluators, **Citicus ONE** records key points that emerge from discussion or testing; gives practical advice on how to reduce risk; and keeps track of action items. It is this combination of features that makes **Citicus ONE** the world's best, fully-fledged information risk management system.

Samples of individual results

Citicus ONE evaluates risk by measuring the five factors that together determine or indicate the chance of the enterprise suffering harm due to a loss of the integrity, availability or confidentiality of information.

It presents the status of these five factors in the form of an easily-understood risk chart (as shown below).



Risk charts are combined with other details to provide each owner with an individualized management report that highlights the status of controls (current versus previous period) and of improvement management activity.

Risk charts for current and previous period highlight changes in risk over time

Citicus ONE Individual risk status report		
Reference	Group accounts consolidation (RIS199)	
Risk description of the business application	Consolidation monthly accounting system from all divisions and business units	
Assessability	The designated owner of the business application is Emily Owen. The evaluation is based on data provided by Emily Owen.	
Need for information protection	The percentage of sales for other key activity handled by the application is not applicable to this enterprise. Approximately 800 users are supported by the application. The enterprise could suffer 'extremely serious harm' if the confidentiality of information was lost. The enterprise could suffer 'very serious harm' if the availability of information was lost. The enterprise could suffer 'very serious harm' if the availability of information was lost for 1 day. Overall, the application appears to be 'very highly critical' to the well-being of the enterprise.	
Measured profile of information risk	A measured profile of risk for this application is presented below.	
Profile for last reporting period	Profile for current reporting period	
Opportunities for improvement by control area	Control Action Opportunity for improvement	
Ownership	OK Planned	OK
Organisation	OK Planned	OK
Risk identification	OK	OK
Service agreements	OK	OK
User capabilities	OK	OK
System configuration	OK	OK
Data backup	OK	OK
Physical security	OK	OK
Access for information resources	OK	OK
Change management	OK	OK
Special controls	OK	OK
Audit/Review	OK	OK

Need for improvement in particular control areas highlighted, with clear priorities for action

Recognizing that systems rarely stand alone, the status of controls applied to supporting and supported systems is also reported to each owner, thereby helping them understand their 'dependency risk'.

Explains the numeric ratings that drive the red area of the current risk chart, in plain language.

Citicus ONE Individual risk status report			
Contribution to risk profile	The table below shows your rating for each of the components of risk plotted on the risk chart. The risk rating is shown as both a descriptive rating and the percentage of the maximum possible value (0-100%).		
Component of risk	Risk rating for this reporting period Estimated value for risk chart		
Criticality	Very highly critical 75%		
Control weaknesses	3 control weaknesses apply 40%		
Special circumstances	1 special circumstances apply 70%		
Level of threat	1-100 incidents a year 70%		
Business impact	Very serious harm 75%		
Dependencies	This table below lists related information resources, the nature of the relationship and their risk status as measured on the data table.		
Group treasury mgmt system	Group treasury mgmt system support consolidation	Fails - rate on same server	28 Oct 2003
London data centre	London data centre	Rate server that supports CACC2 system	28 Oct 2003
Group-wide WAN	Group-wide WAN supports Group accounts consolidation	Group-wide WAN supports CACC2 system	28 Oct 2003
Accounting ledger systems	Accounting ledger systems support consolidation	Fails - quality and consistency of data varies a lot	Not Monitored
Group MIS	Group MIS is supported by Group accounts consolidation	Reverts from CACC2 system control component to CACC2 system	28 Oct 2003

Shows the risk status of any systems that support or are supported by this one.

Together, these individual reports encourage owners to take a personal interest in driving risk down, keep track of their progress in doing so, and press for improvement up and down the line. This helps maintain the dynamic for improvement.

Sample high-level results

Citicus ONE enables evaluators to produce insightful high-level results by aggregating data from individual results, eg all corporate systems or all systems that support the sales process. Two types of high-level result are illustrated below.

Information risk league tables can be used to identify which business applications or components of your IT infrastructure have the most control weaknesses or pose the greatest risk to an enterprise.

Top 10 information resources in information risk league table

Information resource	Risk ranking	Criticality	Control weaknesses	Special circumstances	Level of threat	Business impact
SecurNet (IRS10)	1	100%	82%	86%	100%	100%
New York data centre (IRS99)	2	100%	76%	100%	50%	25%
European data centre (IRS100)	3	75%	100%	53%	100%	50%
Group treasury mgmt (IRS102)	4	75%	100%	43%	100%	75%
Global e-mail (IRS133)	5	75%	100%	71%	100%	50%
Accounts consolidation (IRS29)	6	75%	94%	71%	100%	25%
E-banking (IRS127)	7	75%	94%	86%	75%	50%
London data centre (IRS108)	8	75%	94%	71%	100%	50%
Group-wide WAN (IRS2)	9	75%	94%	86%	100%	75%
Billing system (IRS112)	10	75%	88%	71%	75%	25%

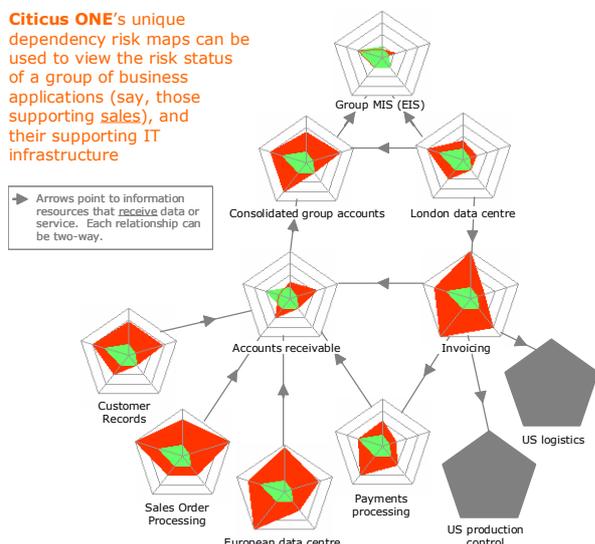
Bottom 10 information resources in information risk league table

Group EIS (IRS50)	154	25%	12%	86%	50%	25%
Payroll (IRS46)	155	25%	6%	43%	50%	25%
DELTAIC (IRS24)	156	25%	0%	29%	50%	0%
UK sales information (IRS57)	157	25%	0%	0%	50%	25%
CashTR (IRS42)	158	0%	100%	29%	75%	25%
Vehicle management (IRS34)	159	0%	82%	43%	100%	25%
Fault recording (IRS93)	160	0%	65%	14%	50%	0%
Performance recording (IRS15)	161	0%	59%	29%	100%	50%
Contracts register (IRS104)	162	0%	47%	57%	50%	0%
Expense claims (IRS88)	163	0%	24%	14%	100%	25%

Comparisons with other companies can be made by including benchmark data provided by Citicus Limited.

Dependency risk maps™ look at risk in a different way. They show the relationships between groups of related applications (eg all those supporting the sales process), and the IT infrastructure that supports them, and highlight their risk status.

Citicus ONE's unique dependency risk maps can be used to view the risk status of a group of business applications (say, those supporting sales), and their supporting IT infrastructure



Evaluators can use such risk maps to set priorities for further evaluations and improvement, and to identify risk 'pinch points'.

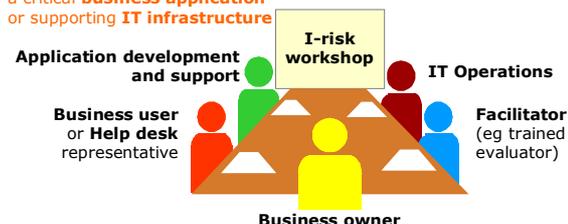
Along with the other high-level results produced by **Citicus ONE** (high-level risk status reports, criticality league tables, incident lists and statistics), these graphical outputs can be used to communicate the risk status of your organisation's financial reporting systems to internal decision-makers, Audit Committees and auditors, as required by Sarbanes-Oxley regulations.

Two-phase evaluation cycle

Unrealistic or inefficient evaluation processes quickly fall into disrepute. What's needed is a way of evaluating controls that treads lightly on an organization, produces reliable information and confers real business benefits.

The evaluation process supported by **Citicus ONE** is designed to achieve these objectives. It combines self-assessments with facilitated evaluations led by trained staff.

A facilitated evaluation brings business and IT people together to assess the completeness and effectiveness of controls applied to a critical **business application** or supporting **IT infrastructure**



Both types of evaluation are orchestrated in a two-phase cycle that is designed to encourage and assist owners of individual business applications or supporting IT infrastructure to:

- reduce the number of information incidents they have to contend with (by identifying and remedying their root causes)
- bring controls up to scratch.



Involving business and IT people in the process encourages people 'on the ground' to focus on what matters and to get things done.

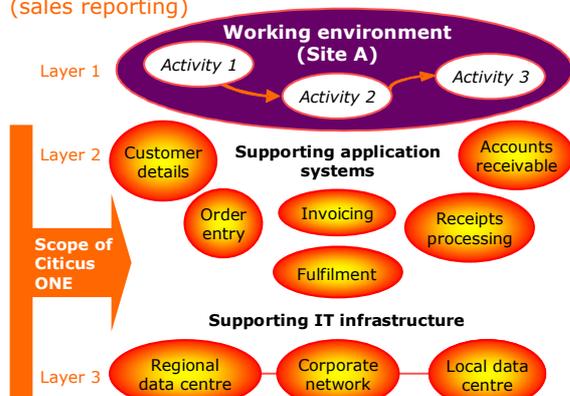
The two-phase approach - combining self-assessment with facilitated evaluations - also enables evaluators to deploy their efforts efficiently, as illustrated by the sample evaluation plan below.

Evaluation plan for:	Year 1				Year 2			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Sales process								
Accounts receivable	Self-assessment	Facilitated evaluation + testing						
Payments processing	Self-assessment	Facilitated evaluation + testing						
Sales order processing	Self-assessment	Facilitated evaluation + testing						
Invoicing	Self-assessment	Facilitated evaluation + testing						
Customer records	Self-assessment	Facilitated evaluation + testing						
US logistics	Self-assessment	Facilitated evaluation + testing						
US production control	Self-assessment	Facilitated evaluation + testing						
European data centre	Self-assessment	Facilitated evaluation + testing						
London data centre	Self-assessment	Facilitated evaluation + testing						

Citicus ONE's fit with compliance activity

Sarbanes-Oxley requires evaluation of all the controls applied to financial reporting processes. The make-up of a typical process is shown below. It is the bottom two layers of the process that are best evaluated using **Citicus ONE**, as the tool is optimised for this purpose.

Make-up of a typical financial reporting process (sales reporting)



Within each layer, **Citicus ONE** can cover two types of control, ie:

- **generally-applicable controls** ie that apply to all business-critical information systems
- **additional, process-specific controls** that cover threats to particular classes of system (eg those supporting the sales process).

Examples of each type of control are shown below.

Breakdown of controls applied to a typical financial reporting process (sales reporting)

Nature of controls	Control environment	
	Working environment (sites and activities)	Supporting applications and IT infrastructure
Generally-applicable controls	Accounting policies Personnel policies Problem / incident management procedures Workplace security measures	Controls as set out in your corporate standard of practice for IT or some other recognised standard of practice (eg the ISF Standard, ISO 17799, COBIT)
Additional, process-specific controls	Control objectives for this process Arrangements made for handling: <ul style="list-style-type: none"> • orders obtained via fax / mail. • payments made by cash, cheques etc Supervision of discounts, refunds, adjustments and other special procedures Staff training Cover for key positions	Functionality to ensure eg: <ul style="list-style-type: none"> • orders are within credit limits • special terms are properly approved • credit notes correspond to invoice • invoices are recorded in their proper period • cash receipts are accurately recorded • customer details are accurately recorded • Notification of shipments / fulfilments

Citicus ONE can be used to evaluate the two classes of control in this column

To save work, **Citicus ONE** comes pre-loaded with a number of widely-recognised standards of practice.

These can be easily customised to suit your organisation's particular needs and variants can be prepared incorporating the additional, process-specific controls, in line with your control objectives.

Achieving integration

Individual companies have different views of how to achieve compliance with Sarbanes-Oxley. However, the following generic road map helps show, in broad terms, where **Citicus ONE** fits into the picture.

Road map for achieving Sarbanes-Oxley compliance



The road map assumes that a multi-disciplinary compliance team is set up to drive compliance activity.

The team identifies key financial reporting processes and control objectives / requirements. Those applying to working environments are separated from those that apply to business applications and IT infrastructure and each class of control is then set up in the appropriate evaluation tool.

The two types of evaluation then proceed in parallel and the results are brought together in Step 10.

Such a harmonised approach can:

- improve the **efficiency** and **value** of the evaluation process
- improve the **accuracy** and **realism** of evaluations
- cut the **cost of compliance**.

Further information

Expert advice on evaluating controls and training in the use of **Citicus ONE** is available from Citicus Limited.

For further information on how we can help you obtain a clean bill of health for your financial reporting systems, contact:

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