

Protect Your CEO & CFO - How MDA Can Help Your Company Comply with Sarbanes-Oxley and Develop One-Source of the Truth!

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The 2002 Sarbanes-Oxley Act requires the CFO's and CEO's of publicly traded companies to attest to the accuracy of their external financial reporting with their signatures. The act will also require a number of other precautions such as implementing a system for employees to anonymously report suspected accounting or auditing misdeeds.

According to PricewaterhouseCoopers' Dennis Nally in an on-line article entitled *Sarbanes-Oxley: The Struggle to Catch Up*, published in Business Week On-Line, the vast majority of public companies are nowhere near ready to meet the new law's deadlines.

"Auditors and finance executives are in the midst of coping with the biggest rule change in their professional careers, and a deadline is approaching. In hopes of some insight into the challenges of the Sarbanes-Oxley Act and its requirement that auditors attest to the state of their clients' internal financial controls, a capacity crowd jammed the rooftop ballroom of the St. Regis hotel in Manhattan on Nov. 12. Largely composed of board members on audit committees, the audience sat beneath the trompe l'oeil ceiling painted with clouds and blue sky, focusing worried glances on Dennis Nally, chairman of audit giant PricewaterhouseCoopers."

"What they heard from Nally couldn't have come as welcome news. For the first time, the auditors of most public companies will have to attest to these controls as part of their 2004 annual reports to shareholders, most of which will be filed in February and March. A recent assessment by more than 700 PwC audit teams found that only 20% of clients are on schedule to complete their internal control reviews, according to Nally."

"There's a lot of risk out there," Nally warns. At least 10% of the audit-team sample is at "extreme risk" of not finishing in time to get an auditor review, Nally noted, adding that 20% of companies overall might fail to meet deadlines. If those reviews aren't finished, it's possible auditors won't be able to sign off on annual reports -- never a good thing in investors' eyes. And while smaller companies have petitioned for an extension of their deadlines, the Securities & Exchange Commission has so far not granted a single reprieve."

There is a real issue and opportunity to correct this problem. Can it be corrected before non-compliance issues hit the fan and several senior managers are discussing matters before the courts? Probably not! Hundreds of corporations will be in non-compliance. Many corporate executives will be signing bogus reports that can be successfully challenged by their shareholders and the Federal Government.

The issue and opportunity relates to securing *one source of the truth* for any major corporation. The cornerstone of one source of the truth for corporate reporting is its general ledger system. For the last fifty years, hundreds if not thousands of companies have grown through acquisition of companies, business groups and products. It is not uncommon for Fortune 2000 companies to have multiple general ledgers. One of the largest and most prestigious telecommunications companies that I consulted to have many different billing systems. In just its PCS group, it has over forty different billing systems.

Typically, companies have multiple general ledgers and CFO's face a nightmare when it comes to getting the data accurately on revenue and costs, closing their books and reporting their finances accurately. The problem is compounded by layers of organizational reporting that requires too much time to gather information, reconcile the data, consolidate it and report the information accurately in a timely fashion. According to the Hackett Benchmarking Group, most finance groups of companies spend about 20% of their time gathering the data, 20% reconciling it and 30% consolidating it. Sarbanes-Oxley places more stringent demands and requirements on reporting that most companies are spending another 10-15% of the pie reconciling the reconciliations. That leaves about 5% of the time to distribute the information via the web, an easier task, and only 5% of time for analysis. This is not such a refreshing thought, especially if you are the company auditors. Most company's decision support systems are inverted as only 5% of the time is invested on financial analysis. On average, an additional 20% of work is demanded of analysts by their senior managers on an "*ad hoc*" basis, as middle managers are asked to answer questions after meetings because the data was not available or clear.

Most *best-in-class* companies have tried to solve their data and reporting problems by installing *On-Line Analytical Processing* (OLAP) technology as a means to slice and dice their data. This in no way presents an opportunity to achieve one source of the truth. It only masks the root cause of their problems, i.e., a systematic methodology to get at and achieve one source of the truth based on a realistic understanding of their theory of the business. As Peter Drucker said in his article that appeared in the September – October 1994 of the Harvard Business Review, most companies do not understand *The Theory of the Business*. Expressed in more contemporary terms, corporate leadership does not understand their business model. Today, there are no systematic and agile IT processes in place to solve their current Sarbanes-Oxley problems let alone to synchronize the Sarbanes-Oxley solution as their business model changes. In short, corporate executives are reacting by putting band-aids on the problem.

MDA Overview – A Five-Minute Summary for the CEO & CFO

Model Driven Architecture (MDA) as spearheaded by the Object Management Group (OMG) is an approach to collaboration and design targeted at creating agile and cost effective IT solutions to business problems such as a company's migration to an agile Sarbanes-Oxley solution. MDA is an OMG methodology and collection of standards for authoring, transforming and managing specifications that apply to any *company's theory of the business*, its processes, systems and architectures. The methodology is both

generic yet comprehensive enough to support the principled design, development, testing, provisioning, sustainment, evolution and lifecycle management of systems, typically referred to in management circles as *cradle-to-grave* systems management. By treating computing, including software and hardware, as a system of interrelated specifications MDA adapts to a wide spectrum of applications and architectural approaches with its principled machinery for authorship, transformation, and management.

MDA standards and associated methodology outline how to separate and model business rules into platform independent models (PIMs) divorced from the ever-changing technical environments required of platform specific models, referred to as PSMs, that execute operations.¹ Once an executable architectural or solution model has been developed through collaboration, MDA through an Enterprise Distributed Object Computing (EDOC) compliant tool can do the heavy lifting by offering significantly greater capabilities over an assortment of United Modeling Language (UML) compliant tools. The EDOC specification is a relatively new standard or extension of UML and a new UML diagram. EDOC unifies multiple UML diagrams. Prior to EDOC, designers and architects would have to utilize a number of diagrams such as *class*, *use case*, *state*, *deployment* and *interaction* representations that now can be united within EDOC and leveraged in an EDOC compliant tool. Consequently, the business case labor savings associated with utilizing EDOC versus multiple types of static UML diagrams and tools are significant. EDOC is an outstanding application for Enterprise Architecture (EA), Service Oriented Architectures (SOAs), Systems of System (SoS) views, Component Based Development (CBD) and, most appropriately, Business Process Management (BPM). It is BPM that serves as the foundation for improvements to a corporation's financial planning processes (budgeting and forecasting), performance reporting and analysis (business intelligence) to support an effective plan for the implementation of Sarbanes-Oxley.

Another significant benefit of the EDOC standard is that it provides designers and modelers a way to depict roles, activities and activity choreography, i.e., an orderly sequence on how the activities play out between people and systems to frame and solve an enterprise's Sarbanes-Oxley solution. EDOC modeling can also more accurately represent an enterprise's business rules, processes, and Sarbanes-Oxley business problem modeled in an executable software tool and run as a simulation. Furthermore, an EDOC compliant tool can automate code generation and testing, specification development, and the documentation of other artifacts such as management reports and systems documentation. With MDA, all the components, artifacts, interfaces, models, sub-systems, etc., can be stored in a *Meta Object Facility* (MOF) as valuable corporate assets (intellectual property) to be reused to drive down design, development, testing, provisioning, sustainment (maintenance) and overall lifecycle costs. The MOF provides a means of defining metamodels and is the standard for model and metamodel

¹ To simplify the discussion for the CEO, CFO and senior managers outside of IT, no reference to and discussion of a *Computation Independent Model* (CIM) has been addressed. A CIM expresses objective, function, process, policy and constraints of a system in non-computational terms, e.g., domain, business rules, business vocabulary, etc. As CIM is a much more friendly concept for non-technical managers to understand, this author has chosen to focus on Platform Independent (PIMs) and Specific Models (PSMs).

repositories specifically outlining how specifications are managed. With these huge benefits available at a time when corporate executives and external stakeholders alike are yearning for better performance with accuracy, why is MDA one of the best-kept secrets in best practices? Or phrased another way, now that the Sarbanes Oxley requirements are at the eleventh hour of implementation, why have corporate executives waited to implement this solution?

In an earlier article, I mentioned that for years corporate America has operated under the premise that the smartest people are at the top of the organization. This may be an irrelevant assumption, as the “doers” in companies tend to be middle managers that have to execute corporate strategies and the information technology professionals who support line management in meeting their performance targets. A more pertinent assumption or fact addresses who is leading the transformation effort at large public corporations. According to Peter Drucker, “the CEO should be leading transformation. That’s what CEO’s get paid for.”

So why hasn’t MDA and EDOC gained notoriety at the CEO level and outside the realm of the OMG? During the last decade, the middle managers that have worked so hard to develop OMG MDA, systems architectures and repository standards have had little clout back at their sponsoring organizations. Middle managers have struggled to find ways to move the concept up the chain of command and out of IT.

A second problem exists when it comes to EDOC, a major OMG standard involved with solving interoperability and the Sarbanes-Oxley problem. The EDOC standard, more correctly referred to as a specification, is technically an extension of the UML standard that is a cornerstone of MDA. As an extension, it does not have the visibility that it should receive. It may not be fully understood by the software systems developers of large software companies that have primarily concentrated their efforts on UML compliant tools. Within the OMG, there are tens of vendors that have marketed more than 110 UML tools while there are very few EDOC compliant tools. So, although EDOC is one of the most empowering technology specifications, it has more limited exposure.

How MDA Can Help – Framing Your Initial Sarbanes-Oxley Solution

MDA can provide the methodology to help the CFO and CEO develop a systematic and agile Sarbanes-Oxley solution. By being agile, the solution can be modified in days or minutes as opposed to years and months.

For the last half-decade, corporate focus has been on getting financial information out of spreadsheets and into a multi-dimensional technology, commonly referred to as On- Line Analytical Processing (OLAP) technology. Unfortunately, OLAP only addresses the tip of the iceberg, not its base. MDA can address the root cause, i.e., the base of the problem and can assist any enterprise with improving its financial reporting processes, developing a Sarbanes-Oxley solution, building interfaces and links to legacy systems in fractions of the time as well as importing and correcting data from source files and feeder systems.

The first major transformation is to model an MDA Sarbanes-Oxley process solution. The objective is two-fold. Step 1 is to develop the necessary platform independent models (PIMs) that frame the entire Sarbanes-Oxley solution. First, model the process steps. Secondly, expand the model to show all the relationships to all financial systems. In modeling steps one and two, the IT designer (modeler) should create a Platform Independent Model (PIM) for both the process and its relationships to all financial systems. This will require collaborating with your company financial subject matter experts (SMEs), internal and external auditors and legal staff. The PIM can be developed to model Sarbanes-Oxley business requirements at a high level and frame a solution that is broad and deep, the entire Sarbanes-Oxley problem. It should model every aspect of the financial reporting environment, all systems and processes. By extending the modeling into the enterprise financial systems, the modeler and SME should examine ties to the budgeting, forecasting, performance reporting and performance analysis systems, the latter being the essence of decision support. The PIM can be expanded to include all of the company's lines of business (LOB's) and can further examine domestic and international reporting requirements. Remember, most multi-national corporations have to keep two sets of books. I do not mean the "real" books and the "cooked" books. Multi-national corporations have to maintain their domestic and international books for tax purposes and reporting. In many cases the international books are country specific. This is an ideal application for MDA and EDOC modeling. The benefits of using the MDA process, an EDOC compliant tool and OMG standards is that the models that are developed will contain a number of smaller, reusable components that are now assets of the corporation. These systems that are developed will be open architecture solutions that are not proprietary vendor solutions.

The second major transformation is to provision or link the PIMs to each specific technology platform that the solution must support by developing Platform Specific Models (PSMs). Once a complete PIM view of the Sarbanes-Oxley solution has been developed as discussed in Step 1 above, then the specific software technical platform solutions, called PSMs, can be created utilizing the EDOC modeling tool to create the mappings between the PIM and the PSMs. The tool should be used to provision (map) the PIM to the PSM and map PSM down to the appropriate artifacts such as code, documentation, deployment and configuration files, test and instrumentation harnesses and test suites. The PIM solution should be connected with as many LOB and reporting systems as possible. Additional components may have to be developed and added to the EDOC tool library. PIMs and PSMs can be stored in the tool or on a hard drive. Ideally, these models with their valuable components should be stored in a Meta Object Facility (MOF), a repository for objects as previously discussed.

A third major transformation or application of MDA modeling might be to develop a PIM of your enterprise architecture (EA). This PIM would model all systems and interfaces. With the Sarbanes-Oxley PIM in place (Step 1 of the first transformation) and the Enterprise Architecture (EA) modeled, the EDOC tool can be configured to assist with a *gap analysis* showing the differences between the PIM for the Sarbanes-Oxley process and the enterprise architecture models. The gap analysis is invaluable intellectual

property. The results of the gap analysis will serve to provide key information to the modelers, financial SME's, management and auditors to add value to their discussions when framing and making their final decisions and tweaking the models. These executable models will also serve to provide a valuable audit trail for data analysis. Utilizing an EDOC tool will allow for the automation of systems and test documentation that is greatly appreciated by the auditors. These first three transformations form the core of modeling your initial Sarbanes-Oxley solution.

MDA – Sarbanes-Oxley Second Generation Activities

The first task is to expand on the initial program by adding considerably more detail, breadth and accuracy to reduce and eliminate risk. The MDA emphasis should be to drill down, cross more organizational lines and expand the accuracy of the initial MDA Sarbanes-Oxley PIMs and PSMs to incorporate all data sources concentrating on the reliability and reconciliation of the data. The priority is to ensure that the models are capturing *one source of the truth*. A standardized billing PIM might have been developed in the initial modeling effort that had a number of variations because of the nature of the parents and child organizational relationships, but now every effort must be made to standardize both the billing processes (PIMs) and their definitions across the enterprise.

Secondly, the modeler must continue to improve on the PIMs by designing better analytics and management reporting to comply with Sarbanes-Oxley. This is an excellent opportunity to improve risk management analysis compared to performance achieved in the initial modeling phase. It is necessary to repeat this process on a quarterly basis and execute a fresh examination of the models. These PIMs and PSMs and their components are assets.

A third objective during this second generation of modeling should be to improve the enterprise's decision support systems. This can be achieved by concentrating on automating new corporate best practice improvements in budgeting, forecasting, performance reporting and analysis into the PIM through the MDA methodology. More analytical capabilities or automated methodologies leveraging MDA should be developed and directed at complementing any OLAP technology solution. One such methodology would focus on developing predictive revenue and cost drivers (metrics). Predictive metrics could be identified and changed over time by applying a driver-based analysis best practice process to the corporate financial planning process using an automated MDA framework.

MDA may not be the silver bullet for solving all corporate problems, but it will offer an established and proven standards based methodology, base practices and information technology specifications to systematically plan, attack, and optimize an enterprise's Sarbanes-Oxley program. There is no substitute for an agile and accurate internal and external management and financial reporting program. If staying in compliance and avoiding serious judicial consequences is important, then MDA offers an immediate solution. Furthermore, the benefits of MDA can preserve the technical core competency of any large public multi-national corporation and it will certainly eliminate the need to

outsource information technology design and software development. Clearly, this OMG methodology and EDOC standard present a best-in-class solution, a best practice, to create a viable Sarbanes-Oxley solution.