



**When Best Practices Aren't  
Good Enough:  
*Challenges in Achieving  
the OMB's Enterprise Architecture*  
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## ***Introduction***

Few people would disagree with the Office of Management and Budget's (OMB) charter—a desire to make the government operate with greater efficiency and more accountability. In short, to operate with a greater sense of responsibility to its stakeholders, the US citizens. The stated goal is for government agencies to operate more like commercial enterprises and to adopt industry's "best practices." As a result, all funding requests to the OMB now require a business case explaining how the project in question will contribute to the government's goals of "simplify, unify, and reuse." In March of 2003, the OMB reported that over 700 projects had been turned back because of poor business cases. Given that there is considerable urgency for improved information sharing for Homeland Security, it is surprising that so few agencies submitting proposals have effectively argued their case. Or is it? On closer inspection of how commercial enterprises evaluate and deploy technology, it becomes clear that the "best practices" from industry are far from optimal and that, when coupled with the procurement protocols currently being used in the federal agencies, these "best practices" render the odds of the OMB reaching its goals a long shot.

## ***Grading the commercial sector on technology evaluation***

A large part of the economic downturn in the technology sector can be attributed to the fact that technology hasn't delivered on its promise. Company after company has attributed its losses to the failure of e-business to deliver. Large companies are now focusing on cutting their IT spending rather than making large IT investments. In other words, if the OMB is looking to industry for "best practices" in purchasing decisions, it may need to look again. The following describes the factors that have prevented companies from achieving the goals of "simplification, unification, and reuse."

### ***The sins of the father***

Hardware has become a commodity, offering customers the competitive advantage of multiple vendors. For example, given the appropriate communication protocols, a new telecommunications server is more or less "plug and play." While the security and applications for the system in question may take considerable programming and/or

tuning, the actual task of getting the hardware components to communicate is relatively straightforward.

Software, on the other hand, is more complex for a variety of reasons, the biggest of which is the cost of data integration. Software only brings value if it understands and can manipulate the pertinent data—whether that data pertains to inventory, shipments, customers, or available aircraft. Unlike hardware, this is not “plug and play.” There are a number of factors that affect the ability to bring up a new software application, including:

- **The characteristics of the current data storage environment.** Given scanner technology, it would almost be easier to migrate a company’s data using paper than to migrate from some existing software environments, many of which can only be accessed by means of interfaces developed by programmers who know (or worse, *knew*) a proprietary application. Accessing data involves understanding the source systems.
- **Subtle differences in the way IT organizations represent data.** These differences range from different units of measurement or part codes to the spellings of customer names. While these differences can be trivial, discovering them is not so easy. Consider the fact that Oracle’s materials resource planning (MRP) application has over 30,000 data elements in its underlying database. Large manufacturing companies may have anywhere from twenty to forty of these applications that have been independently implemented across a variety of sites worldwide. In this environment, data analysis is no simple task.
- **Companies depend on their software applications to run the business.** As a result, the design, analysis and implementation of new applications cannot impede this process. Data extraction cannot impact performance, and production applications may have to change to serve business needs in the process of designing and implementing a new application.

In short, software applications are brittle. Their strength is their speed, accuracy and precision. Their weakness is the precise input required in order to provide reliable

output. For these reasons, it is easier—and cheaper—to shut down a store or a manufacturing facility than it is to shut down a data center. In the case of a store or production line, improvements to the bottom line can be seen within six to eight weeks, while shutting down a data center requires that a company spend *more* money for anywhere from three to six months.

Consequently, most large companies—particularly those that have grown through merger and acquisition—postpone the consolidation of applications because they see no “business advantage” to this short-term cost increase. However, the result is that companies often have multiple, equivalent but distinct applications, including multiple versions of the same enterprise resource planning (ERP) package.

While no one should underestimate the risk and cost associated with a consolidation effort, in many ways these decisions are penny-wise and pound-foolish, as this proliferation of applications is a large part of what is adding to the total cost of software ownership. In 2000, AMR, an industry analyst with its roots in manufacturing, cited their customers as saying that for every dollar they spend on a software product, they spend ten dollars in implementation and deployment, and one hundred dollars on maintenance over the first five years of ownership.

Before discounting these figures as inflated, consider the case of a major electronics manufacturer that has forty-two manufacturing sites, each of which has a site-specific implementation of one of four or five packaged applications. In order to implement a supply chain application, they had the application administrators create forty-two flat file feeds, and buy a server and a data warehouse product in order to consolidate the necessary information so it could interface to the supply chain management (SCM) application. Now tally the costs: software maintenance, hardware maintenance, and personnel costs for each of the forty-two systems; initial hardware, software and staffing costs for the data warehouse, as well as the cost of the SCM application—and annual maintenance costs on these items once the SCM application is implemented.

Moreover, there is no diet pill that makes the pounds melt away. Success will require a long-term commitment and consistent effort driven by top management.

### ***Internal resistance to change***

There are two barriers that increase the cost and risk of application consolidation—the technical and the cultural. While the technical is difficult, the appropriate tools and methodologies can reduce that cost and risk, but only if a company understands and copes with the people problems. One of the primary benefits of application consolidation is the opportunity to reduce personnel requirements. The staff that supports the applications to be retired (whose skills are frequently not suitable for the newer application environment) comprises employees who would be terminated. As a result, unless project management is sufficiently vigilant, it is quite easy for consolidation efforts to experience cost or schedule overruns—or even meet resistance in the decision-making process. As a personal example of this type of resistance, in a recent meeting with a systems integrator regarding the appropriate use of the ETI® products in implementing a solution for a government client, ETI personnel pointed out that the appropriate use of the software could significantly reduce the number of programmers required to deliver the solution. One of the project managers said, “You know, a lot of people make their living writing that kind of code.”

### ***The process of buying software***

The cost of software ownership also increases because of the way certain software purchase decisions are made. Companies often escalate strategic software decisions to the corporate level—the choice of a hardware platform, a corporate database, an ERP suite. In other cases, they decide on the application and leave the choice of the software products to the project team. Because there are no global criteria for software purchases within the company, it is common for one team to choose one product and then another team to choose a competitive product. Too frequently, these decisions are based on some feature-function comparison, where some particular attribute—the graphical interface, for example—may be weighted to the exclusion of another product that could actually be used across projects.

For example, consider the electronics manufacturer described above. Management knew that within twelve months of completing the supply chain management (SCM) project, they were going to begin the process of

replacing the forty-two materials resource planning (MRP) implementations with consistent installations of a new MRP module from an enterprise resource planning (ERP) vendor. The SCM project team performed a product evaluation in which they determined that they would prefer to purchase a particular product that requires its own server because it is easier to learn, rather than choosing a competitive product with no hardware requirement which could have been used on the subsequent application migration effort. Was the trade-off justified? It's unclear because no one bothered to consider the question.

In other words, it is important to remember that the way people are rewarded—or penalized—often drives decisions rather than what is ultimately best for the company or agency. Sometimes the behavior is deliberate; at other times it's because they were not aware of the larger perspective. In either case, the IT costs—both short-term and long-term—are adversely affected.

### ***Getting help from the experts***

Companies often try to mitigate the above problems by hiring experts to serve as consultants or systems integrators. While these organizations can bring significant experience and skills to the table, there are at least two things to consider:

- Consulting firms associated with industry analysts who sell market studies (and sometimes are affiliated with investment banking firms) frequently may be biased by their research analysts in favor of a product those analysts think will become the market leader in some segment. However, depending upon the consulting firm and the way their practices are set up, the team assigned to the project may have a very narrow view of the technical solutions. For example, an industry analyst may have a business intelligence practice where they focus on data warehouses, an application integration practice where they focus on real-time integration, and an infrastructure practice where they focus on change management, security and configuration management; however, the company actually needs *all* of these problems to be considered when choosing the appropriate product to purchase—both in terms of the product's inherent capabilities, and how the product will

interface to the products already in use by the company for these various capabilities.

- While consultants and systems integrators can bring strong project management and application expertise, they usually have limited experience with the state of the customers' existing systems and must rely—just as internal project managers do—on the existing staff for help in the specification of data mapping between those systems and the new targets.

In short, systems integrators and consultants can bring value—but that value is commensurate with the company's understanding and definition of what it needs.

## **Added disadvantages in the federal sector**

As if these problems weren't enough, the federal procurement process complicates issues even further. Because agencies outsource almost all of their IT initiatives, they often ask systems integrators to do the research and put forth a proposal. In order to prevent giving that integrator an edge in winning the implementation of the project, the integrator that wins the proposal phase is often precluded from bidding the implementation phase. While these guidelines are intended to preserve fairness, they are not necessarily conducive to good results. One of the key problems with software design and technology handoffs is the fact that specifications frequently are not complete—there is a core of knowledge held by the writers that is not adequately conveyed in the document. Precluding the participation of the proposal group in the process of evaluating and implementing the result can—and often does—lead to disappointing results, although few of the cost overruns or missed deadlines make the news.

Furthermore, many of the implementation contracts awarded to federal systems integrators focus on detailing a long list of technical requirements that constitute fulfillment of the contract. If the code runs, no matter how cumbersome and inefficient, the Prime gets paid. Often what are needed are clear goals that deliver a workable business solution that is performance-based. For example, there is a large federal procurement system whose original design and implementation is so unstable

that most Primes are shying away from bidding on the modernization project because of the risks involved.

Finally, a contract on a large project will often be arbitrarily chopped-up and awarded to several systems integrators which leads to disjointed technical solution and huge inefficiencies. The Prime gets the architecture and design; another systems integrator gets the implementation of the application and a third handles the data portion. The result can be cost and schedule overruns with no clear-cut accountability. (The commercial analogy would be if the Justice Department had required Microsoft to outsource half of its operating system development to IBM.)

### Improving the odds

As the largest modern merger undertaken, the challenges faced by the Department of Homeland Security are staggering, and it will take close collaboration and support from the Office of Management and Budget to make it successful. Unfortunately, there is no short-term solution, no single purchase or policy change that can undo the past, but with the appropriate attention from the OMB and adequate infrastructure and processes, the DHS can begin an evolutionary path to an effective solution. The evaluation processes should include the following:

- **Define goals for IT that drive the same behavior as that of a commercial manufacturing or distribution organization.** Any purchase of software should be justified in terms of improvements to the agency's overall IT efficiency. Questions like the following should be asked. Are the products being proposed for a particular project applicable to the future projects to be undertaken for other groups? What is the cost of increased deployment if the products are applied to other projects? And so on.
- **Make efficient *change management* a primary goal** and insure that the proposed software and methodology support rapid response to change. In developing this strategy, consider the full range of changes that can affect the IT environment—from changes in regulatory requirements to the “grandfathering” of software products upon which the DHS is

dependent. For both technical reasons and compliance, it is critical to accurately capture an audit trail of how an organization's applications interrelate.

- **Consider the common functional requirements across all IT agencies and reorganize accordingly.** Note that this is no different from choosing to outsource functions that were originally managed internally. Whether it's payroll or human resources, companies have often found savings by leveraging the expertise and economy of scale afforded by using an external service. For example, DHS might create a group that provides data integration support much like it will have a group that runs its network. This strategy can result in huge savings, as evidenced by looking at the audit of a single state.

In January of 2003, the Texas State Auditor's office issued a report recommending that Texas create a plan to consolidate the state's IT projects. The report warned that the state's implementation of its chosen human resources and financial systems software solution could cost the state more than \$100 million due to the duplication of effort. "Texas is at a disadvantage in realizing technology savings and efficiencies because of large projects, inadequate skills, poor contracting practices and co-location rather than consolidation of IT functions and services," the report said. When spending \$1.8 billion per year on technology—nearly twenty percent of the current state deficit—inefficiencies like these can make a significant impact.<sup>1</sup>

- **Understand that adopting these changes will take commitment and repeated emphasis on the part of executive management.** Trying to institute too many changes in IT infrastructure increases the

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<sup>1</sup> Dizard, Wilson P. III. "Texas auditors urge systems consolidation." Government Computer News Online. 22\_January 2003 <[http://www.gcn.com/vol1\\_no1/daily-updates/20936-1.html](http://www.gcn.com/vol1_no1/daily-updates/20936-1.html)>

likelihood of failure. Likewise, unless the DHS is diligent in enforcing these new policies, it will be easy for old habits to re-emerge.

In summary, a good part of disappointing results in IT initiatives comes from people and practices rather than technology. And unless the OMB and the legislators in charge of procurement policy remedy the current practices, the OMB directive to “simplify, unify and reuse” may remain just that.